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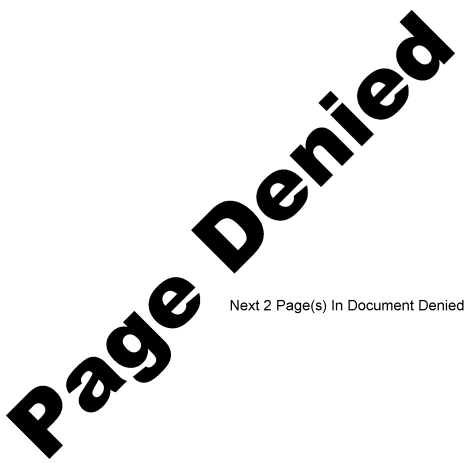
50X1-HUM

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# SPECIFICATIONS:

| | | |
|---|---|---|
| Swing over table | mm | 280 (11″) |
| Swing over table (with raisings blocks) | mm | 370 (1′3″) |
| Length between workhead and tailstock centers | mm | 500 (1′ 8″) |
| Length between right and left-hand tailstock centers | mm | 690 (2′ 1″) |
| Tailstock center above table | mm | 130 (5″) |
| Tailstock center offset from rear table edge | mm | 55 (2.2″) |
| Taper of workhead spindle | metric | 60 |
| | Morse | 5 |
| Horiz. distance - center tailstock to center of wheel head: maximum | mm | 325 (1′ 1″) |
| minimum | mm | 85 (3″) |
| Vert. distance - center tailstock to center of wheel head: maximum | mm | 175 (7″) |
| minimum | mm | 55 (2″) |
| Standard dimensions of grinding wheel: external diameter | mm | 150 (6″) |
| internal diameter | mm | 20 (0.8″) |
| width | mm | 15 (0.6″) |
| Maximum dimensions of grinding wheel: external diameter | mm | 200 (8″) |
| internal diameter | mm | 32 (1.3″) |
| width | mm | 20 (0.8″) |
| Diameter of spindle for internal grinding | mm | 70 (2.8″) |
| Diameter of jaw-chuck | mm | 115 (4.5″) |
| Diameter of magnetic chuck | mm | 150 (6″) |
| Workhead swivels horizontally and vertically | | 360° |
| Table swivels | | 90° |
| Fine swivel movement of table on a dial | | 9° |
| Swivel movement of grinding wheelhead | | 350° |
| Vertical movement of grinding wheelhead | mm | 230 (9″) |
| Longitudinal movement of table (by hand) | mm | 440 (1′ 5″) |
| Cross movement of table (by hand) | mm | 240 (9.5″) |
| Working surface of table | mm | 920 × 140 (3′ × 5.5″) |
| Range of wheel spindle speeds | r. p. m. | 2800 ÷ 5600 |
| Motor of wheel spindle drive: Speed | r. p. m. | 1400 ÷ 2800 |
| Output | kW | 0.7 ÷ 1.2 |
| Floor space required | mm | 1485 × 1860 (4′ 10″ × 6′ 1″) |
| Weight of machine: with standard equipment | kg | 1000 (2200 lb.) |
| with packing | kg | 1065 (2343 lb.) |
| with seaworthy packing | kg | 1370 (3014 lb.) |
| Contents boxed | m³ | 3.5 (124 cu. ft.) |

In ordering, specify voltage, phase and frequency of power supply!
As improvements in design are continually being made, this specification is not to be regarded as binding in detail, and dimensions are subject to alterations without notice.

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**PRAHA - CZECHOSLOVAKIA**

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TOS

# 102

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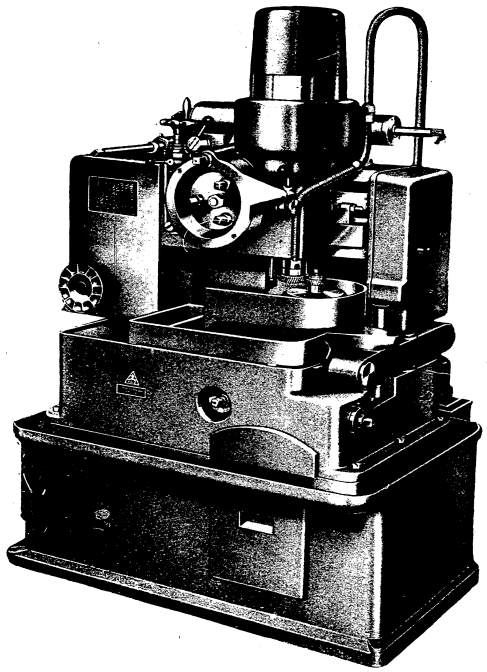
TOS

# GEAR SHAPERS

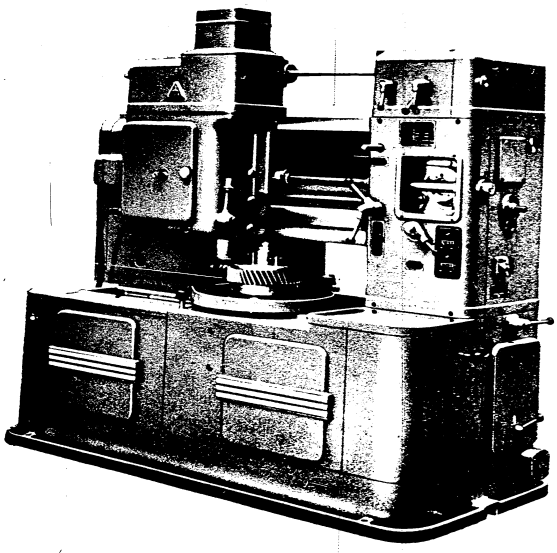


## GEAR SHAPER Type OH 4

| Type | OH 4 | | OH 6 | |
|---|---|---|---|---|
| Maximum real module shaped | 4 | | 6 | |
| | exter. gears | inter. gears | exter. gears | inter. gears |
| Maximum diameter of spur gear | 7 7/8" | 6 1/2" | 19 1/2" | 17 1/2" |
| Maximum diameter of helical gear | 7 11/16" | 6 1/2" | 17 1/2" | 16 1/2" |
| Maximum diameter of gear | 3/8" | 1 3/16" | 1 31/32" | 1 31/32" |
| Maximum width of gear | 19/16" | 1 13/32" | 3 17/32" | 3 17/32" |
| Range of number of tool strokes per minute | 220 to 635 | | 50 to 315 | |
| Output of motor | 1.2/0.75 HP | | 4 HP | |
| Floor space required | 3'1"×4' | | 3'4"×6'11" | |
| Weight of machine with standard equipment | 3300 lbs | | 5500 lbs | |

## HIGH SPEED GEAR SHAPERS Types OH 4 and OH 6

The machines operate on the self-generating principle and are used for the precision shaping of spur and helical gears, both external and internal, as well as of gear sectors, gear type couplings, ratchets, cams, cam discs, polygonal holes, etc. The operation is very simple and the setting quick so that an economical production is achieved even with small quantities or single pieces.



## GEAR SHAPER Type OH 6

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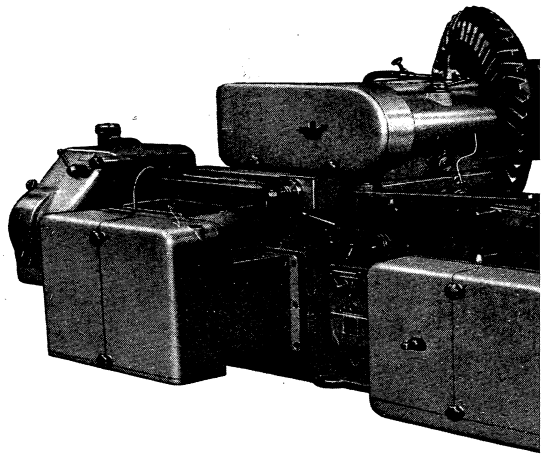
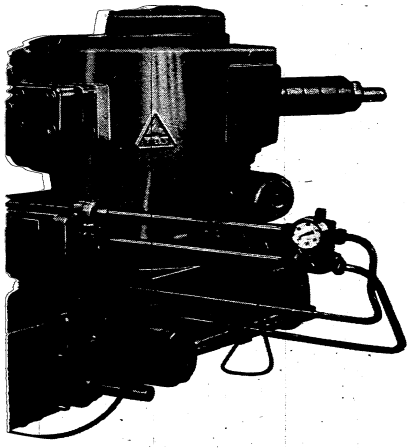
# GEAR CUTTI MACHI





## GEAR CUTTING MACHINE Type OKU 35

The machine is suitable for cutting straight, helical and herrin
cularly well suited for the cutting of herringbone gears becau
The gears are cut by means of simple and inexpensive shar
feed of the cutter into the cut, the rapid withdrawal of the c
stock to its starting position and the rotation of the gear by
hydraulic equipment. All teeth having been cut the machine s

m of both spur and bevel gears. It is parti-
r remains undivided, without the centre gap.
ers with straight or helical cutting edges. The
mpletion of a tooth gap, the return of the head-
tion are operated by an automatically controlled
matically.

| | |
|---|---|
| Maximum diameter of spur gear being cut when clamped to front face of spindle | 7'4 1/2" |
| Maximum width of rim of gear being cut | 24 3/4" |
| Minimum and maximum number of teeth of gear being cut | 13/140 |
| Maximum module | 35 |
| Power of electric motor of headstock | 15 HP |
| Weight of machine with standard equipment | 19600 lbs |

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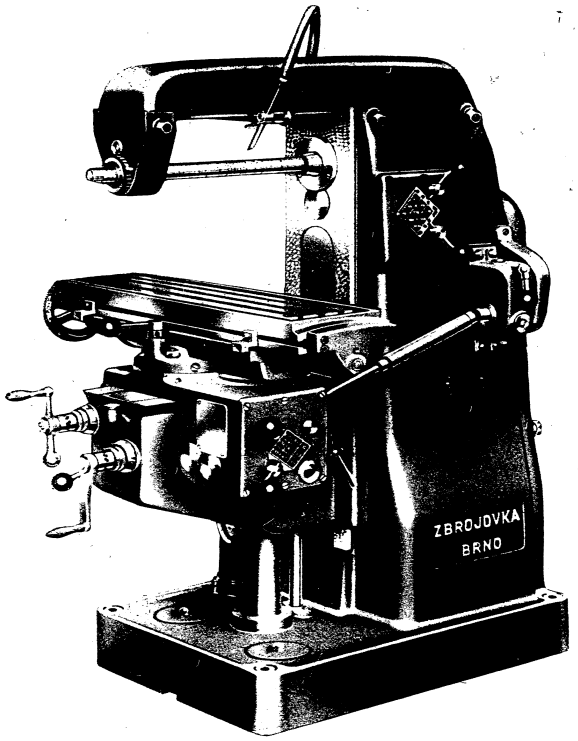
# MILLING MACHINES




## UNIVERSAL MILLING MACHINE Type F2U

The type F2U Universal Milling Machine is intended for all common milling operations on small machinery parts the machining of which on heavy and costly machines would not be economical. There is a choice of machines with various wide ranges of spindle speeds and various longitudinal power feeds to suit the prevailing kind of work and material. A simple method of changing spindle speeds by means of two levers and a similarly simple method of changing longitudinal feeds contribute to the very easy operation of the machine.

The versatility of the machine is increased by additional equipment such as a revolving table with hand drive, a vertical milling head, a universal milling head, a longitudinal dividing attachment, a universal dividing attachment and other items supplied for the machine as optional equipment.

| | |
|---|---|
| Working surface of table | 29 1/2" × 7 7/8" |
| Taper in spindle: standard | Metric 24 |
| optional | ISA 32 |
| optional | No. 3 Morse |
| 9 spindle speeds: standard series I | |
| ranging from | 67 to 1070 r. p. m. |
| high series II | |
| ranging from | 95 to 1520 r. p. m. |
| high series III | |
| ranging from | 132 to 2050 r. p. m. |
| 9 rates of longitudinal feed: | |
| low series A | |
| ranging from | 15/32" to 7 11/16" per min. |
| standard series B | |
| ranging from | 21/32" to 10 5/8" per min. |
| high series C | |
| ranging from | 29/32" to 14 3/4" per min. |
| Power of motor | 1.5 to 2 HP |
| Weight of machine with standard equipment | 168 lbs |

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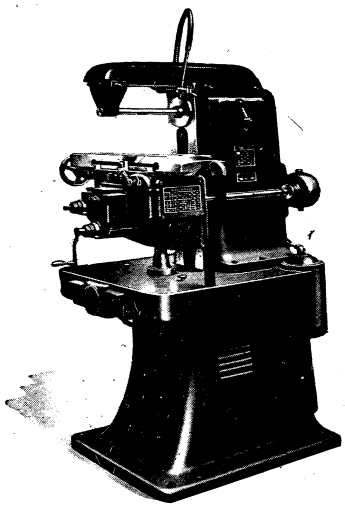
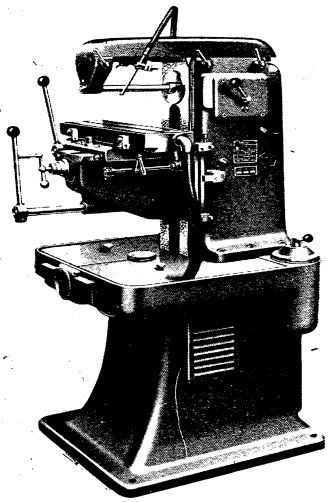
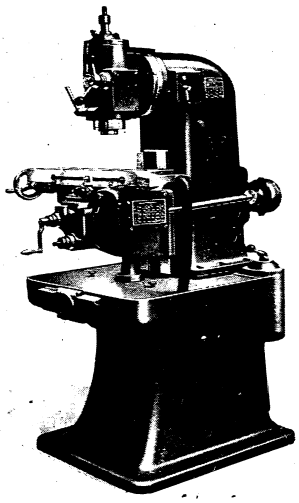
# MILLING MACHINES



HORIZONTAL MILLING MACHINE Model F1J



HORIZONTAL TWO-LEVER MILLING MACHINE Model F1J2



VERTICAL MILLING MACHINE Model F1S

The type F1 milling machines are being built in the following three designs:

Horizontal Milling Machine — Model F1J
Horizontal Two-Lever Milling Machine — Model F1J2
Vertical Milling Machine — Model F1S

The machines are intended for common milling operations on small machinery parts, individually manufactured as well as quantity produced. The high spindle speeds make possible economical milling of steels as well as of light metals. There is a choice of machines with various ranges of spindle speeds and various longitudinal power feeds to suit the prevailing kinds of work and material. Spindle speeds are selected by a change-over switch of the number of poles of the three-speed electric motor and by the lever of the gear box. The power feeds are changed by means of change gears. The two-lever design of the horizontal milling machine has only hand feeds, the longitudinal and vertical feeds being operated by levers, the cross feed by a hand wheel.

| Type | F1J | F1J2 | F1S |
|---|---|---|---|
| Clamping surface of table . . . . . mm | 529/32"×21 1/2" | 529/32"×21 1/2" | 529/32"×21 1/2" |
| Taper in spindle: standard . . . . . | ISA 32 | ISA 32 | ISA 32 |
| optional . . . . . | Metric 18 | Metric 18 | Metric 18 |
| optional . . . . . | No. 2 Morse | No. 2 Morse | No. 2 Morse |
| 6 spindle speeds, range to be selected by customer: | | | |
| range I . . . . . r. p. m. | 190 to 1080 r. p. m. | 190 to 1080 r. p. m. | 190 to 1070 r. p. m. |
| range II . . . . . r. p. m. | 280 to 1530 r. p. m. | 280 to 1530 r. p. m. | 270 to 1540 r. p. m. |
| range III . . . . . r. p. m. | 380 to 2100 r. p. m. | 380 to 2100 r. p. m. | 380 to 2160 r. p. m. |
| range IV . . . . . r. p. m. | — | — | 540 to 3070 r. p. m. |
| 6 longitudinal power feeds, range to be selected by customer: range A . . . . . mm per min. | 21/32" to 7 11/16" per min. | 21/32" to 7 11/16" per min. | 21/32" to 7 11/16" per min. |
| range B . . . . . mm per min. | 15/16" to 10 13/16" per min. | 15/16" to 10 13/16" per min. | 15/16" to 10 13/16" per min. |
| Power of motor . . . . . HP | 1.5/0.8/0.55 HP | 1.5/0.8/0.55 HP | 1.5/0.8/0.55 HP |
| Weight of machine with standard equipment . . . . kg | 990 lbs | 990 lbs | 990 lbs |

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| TYPE | | FA 2 H | FA 2 V | FA 2 U |
|---|---|---|---|---|
| Working surface of table: length | | 7 7/8" | 7 7/8" | 7 7/8" |
| width | | 39 1/4" | 39 1/4" | 39 1/4" |
| Number of T-slots of table | | 3 | 3 | 3 |
| Width × distance between T-slots | | 9/16"×1 21/32" | 9/16"×1 21/32" | 9/16"×1 21/32" |
| Longitudinal travel of table: hand | | 25" | 25" | 25" |
| power | | 24 3/4" | 24 3/4" | 24 3/4" |
| Cross travel of table: hand | | 8 7/8" | 8 7/8" | 8 5/8" |
| Vertical travel of table: hand | | 14 3/4" | 14 3/4" | 14 3/4" |
| Swivel of table in either direction | | — | — | 45° |
| Taper in spindle: standard | ISA | 44 | 44 | 44 |
| optional | Metric | 32 | 32 | 32 |
| optional | No. Morse | 3 | 3 | 3 |
| Diameter of spindle in front bearing | | 5 5/32" | 5 5/32" | 5 5/32" |
| Distance, centre line of spindle to table: maximum | | 15 3/4" | — | 12 1/2" |
| minimum | | 1" | — | 1" |
| Distance, nose of spindle to top of table: maximum | | — | 14 3/4" | — |
| minimum | | — | — | — |
| Distance, nose of spindle to arbor support, ISA/Metric | | 13 1/2"—12 1/2" | — | 13 1/2"—12 1/2" |
| Distance, centre line of arbor to underside of overarm | | 4 5/16" | — | 4 5/16" |
| Distance, centre line of spindle to guideways of column | | — | 9 3/16" | — |
| Maximum swivel of spindle head in either direction | | — | 45° | — |
| Vertical adjustment of spindle | | — | 2 11/32" | — |
| Spindle speeds, number | | 12 | 12 | 12 |
| Ranges: standard range | r. p. m. | 63 to 2800 | 63 to 2800 | 63 to 2800 |
| high range, optional | r. p. m. | 90 to 4000 | 90 to 4000 | 90 to 4000 |
| Longitudinal feeds: number | | 13 | 13 | 13 |
| range | per min | 35/64" to 35 7/16" | 35/64" to 35 7/16" | 35/64" to 35 7/16" |
| Longitudinal rapid traverse | per min | 9'2" | 9'2" | 9'2" |
| Electric motor for spindle drive: speed | r. p. m | 1430 | 1430 | 1430 |
| power | HP | 3,25 | 3,25 | 3,25 |
| Feed motor: speed | r. p. m. | 2770 | 2770 | 2770 |
| power | HP | 0,7 | 0,7 | 0,7 |
| Floor space required by machine | | 4'7"×7'1" | 4'7"×7'1" | 4'7"×7'1" |
| Weight of machine with standard equipment | lbs | 2100 | 2200 | 2100 |
| Shipping weight of machine | lbs | 2400 | 2550 | 2450 |
| Volume of packing case | cu. ft. | 110 | 110 | 110 |
| Dimensions of packing case | | 4'8"×4'8"×5'3" | 4'8"×4'8"×5'3" | 4'8"×4'8"×5'3" |

**STANDARD EQUIPMENT:** Milling arbor with clamping screw, electrical equipment, cooling equipment, grease gun, set of spanners, operating instructions.

PLEASE STATE IN YOUR ORDER THE VOLTAGE AVAILABLE FOR THE ELECTRIC MOTORS.

**The machines are continuously being improved upon. The data given in this prospectus are** therefore not binding in detail.

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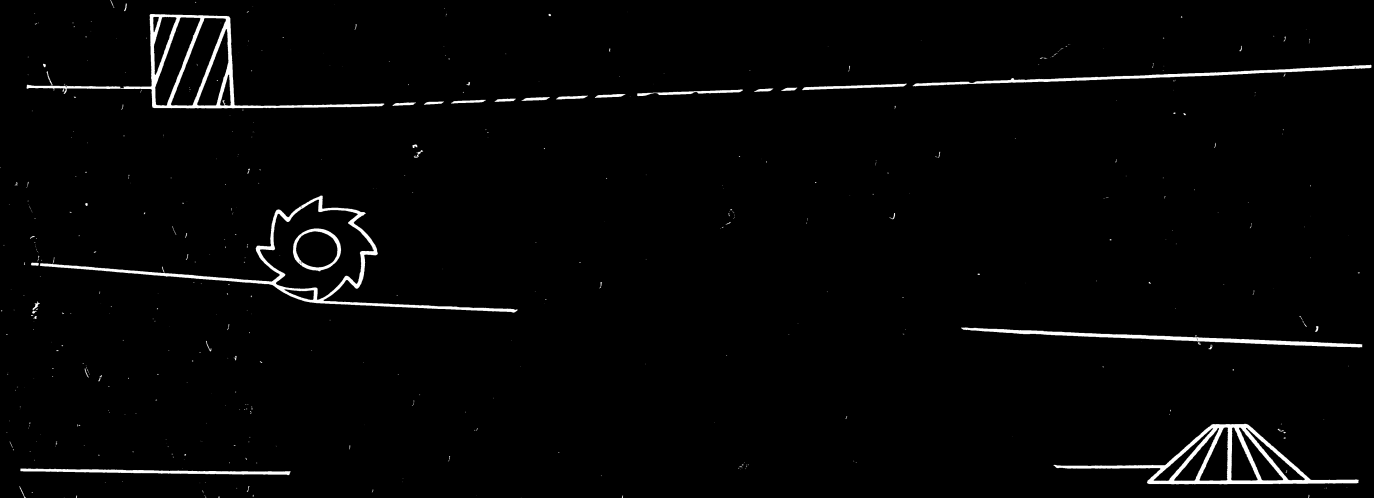

# GAZ

## ZBROJOVKA

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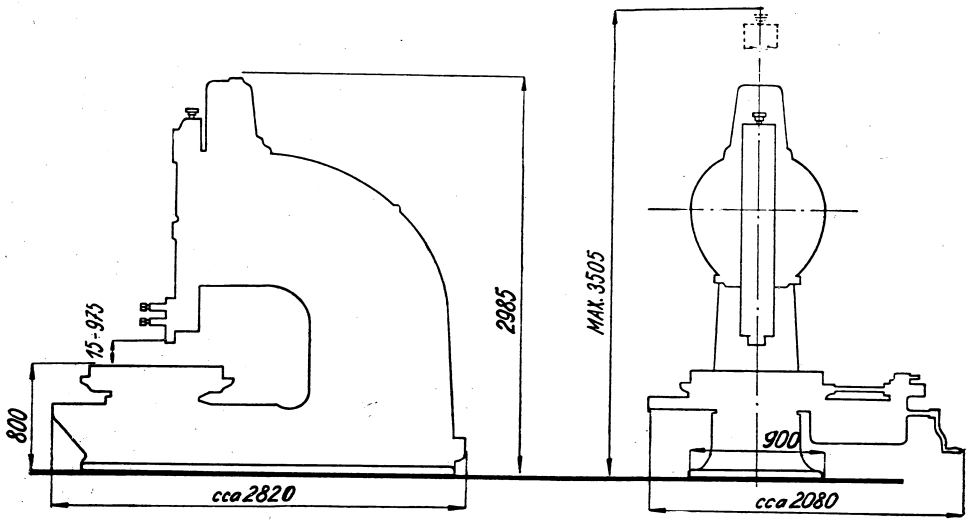
## SPECIFICATIONS

| | | Metric | English |
|---|---|---|---|
| Maximum height of stroke | mm | 450 | 17.7″ |
| Diameter of circular table | mm | 900 | 35.4″ |
| Width/distance between T-slots | mm | 22/200 | 0.866″/7.88″ |
| Cross travel of table | mm | 700 | 27.6″ |
| Longitudinal travel of table | mm | 900 | 35.4″ |
| Adjustment of ram | mm | 500 | 19.7″ |
| Distance, tool edge to column | mm | 950 | 37.4″ |
| Distance, tool edge to ram guide | mm | 240 | 9.45″ |
| Distance, clamping surface of table to lower end of ram guide | mm | 650 | 25.6″ |
| Maximum distance of tool to clamping surface of table | mm | 975 | 38.4″ |
| Cross adjustment | | 10° | 10° |
| Number of speeds | | 6 | 6 |
| Maximum safe cutting speed | m/min | 40 | 131″ |
| Number of strokes per minute | | 11-56 | 11-56 |
| Maximum pulling power | kg | 2500 | 5520 lbs |
| Feeds: continuous longitudinal feed ranging from | mm | 0.2-2 | 0.008″-0.08″ |
| continuous cross feed ranging from | mm | 0.2-2 | 0.008″-0.08″ |
| Main drive motor: Speed | r. p. m. | 1400 | 1400 |
| Output | HP | 15 | 15 |
| Rapid traverse motor: Speed | r. p. m. | 1400 | 1400 |
| Output | HP | 1.5 | 1.5 |
| Coolant pump motor: Speed | r. p. m. | 2800 | 2800 |
| Output | HP | 0.15 | 0.15 |
| Quantity supplied | l/min | 15 | 3.3 gall/min. |
| Floor space required (width × length) | mm | 2080×2820 | 82″×111″ |
| Weight of machine with standard equipment | kg | 7100 | 15.700 lbs |
| Weight of machine with packing | kg | 7500 | 16.600 lbs |
| Weight of machine with seaworthy packing | kg | 8300 | 18.400 lbs |
| Contents boxed | m³ | 21 | 740 cu. ft |

As improvements in design are continually being made, this specification is not to be regarded as binding in detail, and dimensions are subject to alteration without notice.

IN ORDERING SPECIFY VOLTAGE, PHASE AND FREQUENCY OF POWER SUPPLY!

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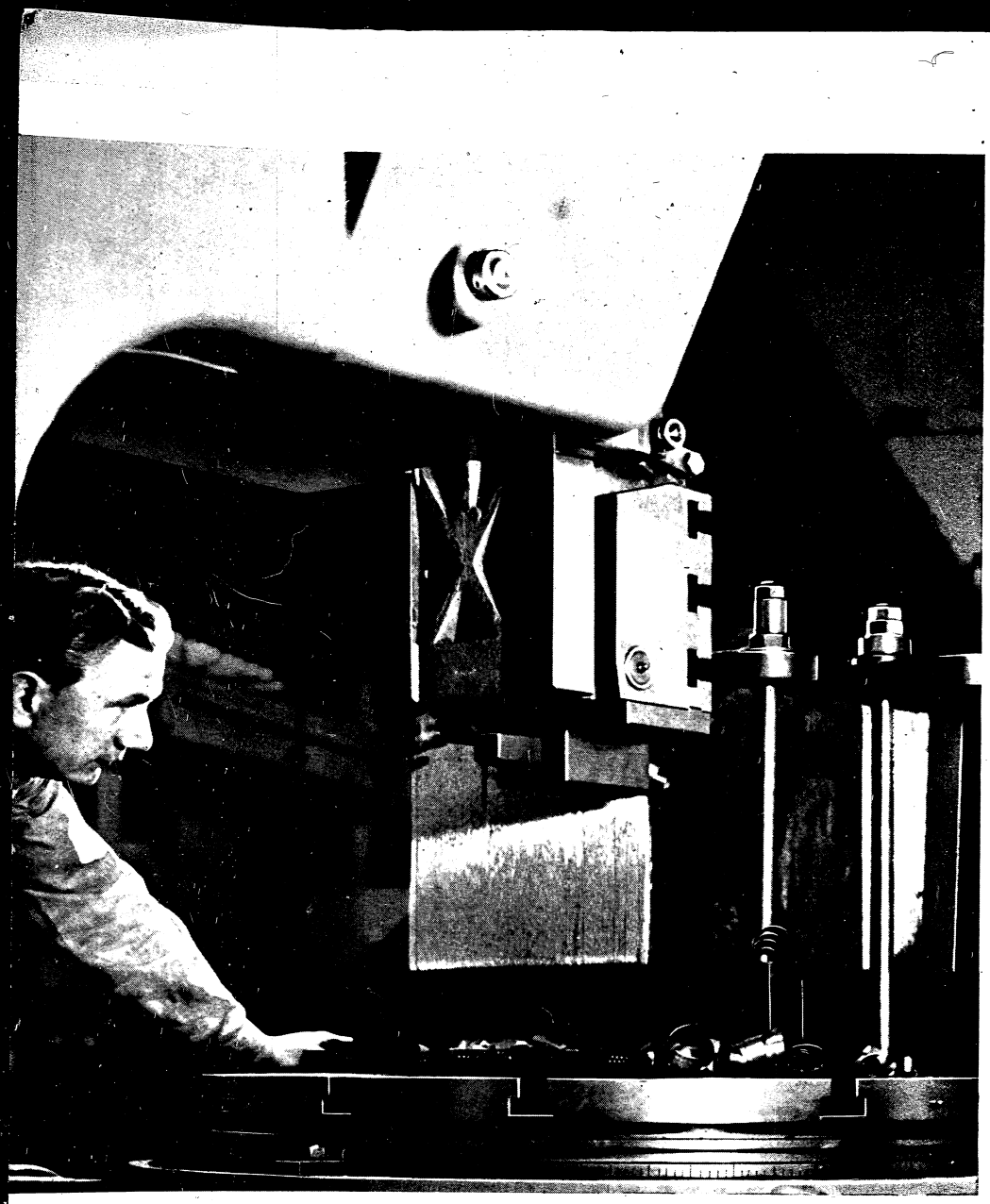

# SLOTTING MACHINE
## Model

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**STANDARD EQUIPMENT:**

Two rail heads
Right-hand side head
Left-hand side head
Tool-holders
Electrical equipment with electromagnetic clutch
Main drive motor with flexible clutch
Rapid traverse motor with pulley and V-belts
Set of spanners and operating tables
Operator's instruction booklet

**OPTIONAL EQUIPMENT:**

Grinding attachment

**IN ORDERING, SPECIFY VOLTAGE, PHASE AND FREQUENCY OF POWER SUPPLY!**

**As improvements in design are continually being made, this specification is not to be regarded as binding in detail, and dimensions are subject to alteration without notice.**

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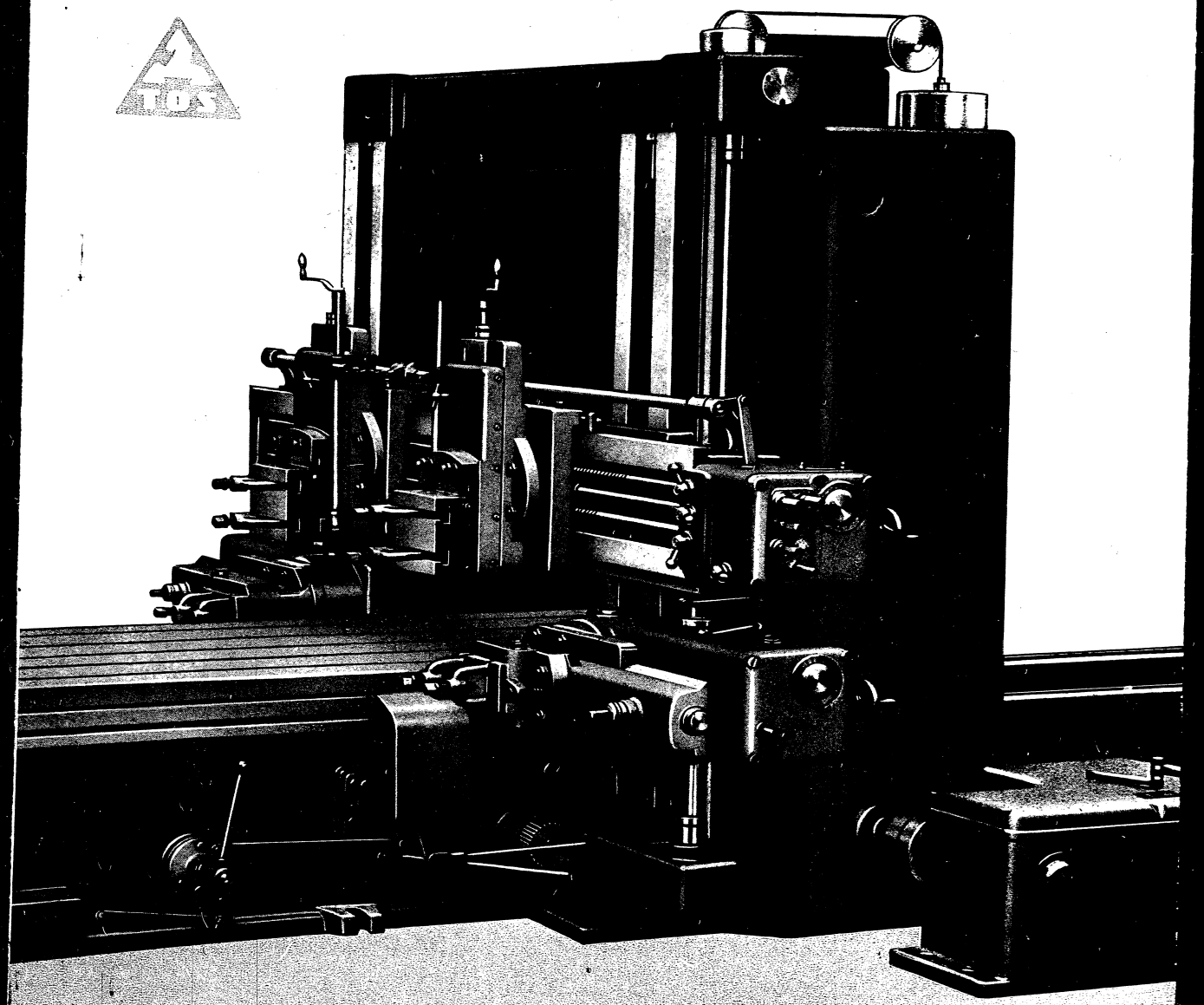

# DOUBLE-HOUSING PLANING MACHINE

# HO 12

**The machine is marked by its rigid construction and ensures a high quality of surface finish even at the heaviest planing operations.**

**Its high output enables economical machining and full utilization of cemented carbide tipped tools.**

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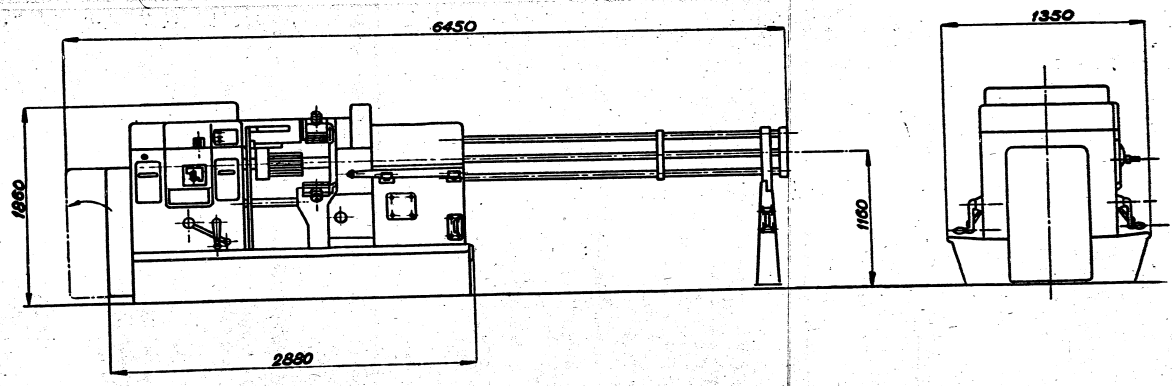
## HAUPTABMESSUNGEN UND TECHNISCHE ANGABEN:

| | | |
|---|---|---|
| Größter Werkstoffdurchlaß: rund | mm | 35 |
| sechskant (Schlüsselweite) | mm | 27 |
| vierkant | mm | 22 |
| Größter Stangenvorschub | mm | 172 |
| Längsvorschübe des Haupt- und der beiden Nebensupporte, unabhängig voneinander einstellbar | mm | 0—100 |
| Rasches Anfahren des Längssupportes | mm | 63 |
| Größte Drehlänge | mm | 100 |
| Arbeitsvorschübe der Quersupporte, unabhängig voneinander einstellbar | mm | 0—18 |
| Rasches Anfahren der Quersupporte | mm | 16 |
| Drehzahlbereich der Arbeitsspindeln (24 Stufen) | U/min | 143—1900 |
| Wechselräder für Drehzahlen | Paar | 6 |
| Wechselräder für Zyklenzeiten | Paar | 5 |
| Anzahl der Zyklenzeiten | | 764 |
| Bereich der Arbeitszyklen | | 4,1—402 |
| Verlustzeiten zwischen den Arbeitsgängen | sec | 1,5 |
| Grundrißfläche der Maschine×Höhe (ohne Magazin für Stangenmaterial) | ca. cm | 288×135×186 |
| Gewicht der Maschine | ca. kg | 6000 |
| Gewicht des Magazins für Stangenmaterial | ca. kg | 200 |
| Verpackung der Maschine | ca. cm | 350×200×220 |
| Gewicht der Verpackung | ca. kg | 1500 |
| Verpackung der Materialführung | ca. cm | 300×60×60 |
| Gewicht der Verpackung des Stangenmaterialmagazins | ca. kg | 270 |
| Motor: Leistung | kW | 9 |
| Drehzahl | U/min | 1460 |

**BEI BESTELLUNG BITTEN WIR, DIE BETRIEBSSPANNUNG FÜR DEN ELEKTROMOTOR ANZUGEBEN!**




**STROJEXPORT**

**PRAHA-TSCHECHOSLOWAKEI**

ČOK 52384 n - 5507 - Svět 06 594-55

Gedruckt in der Tschechoslowakei

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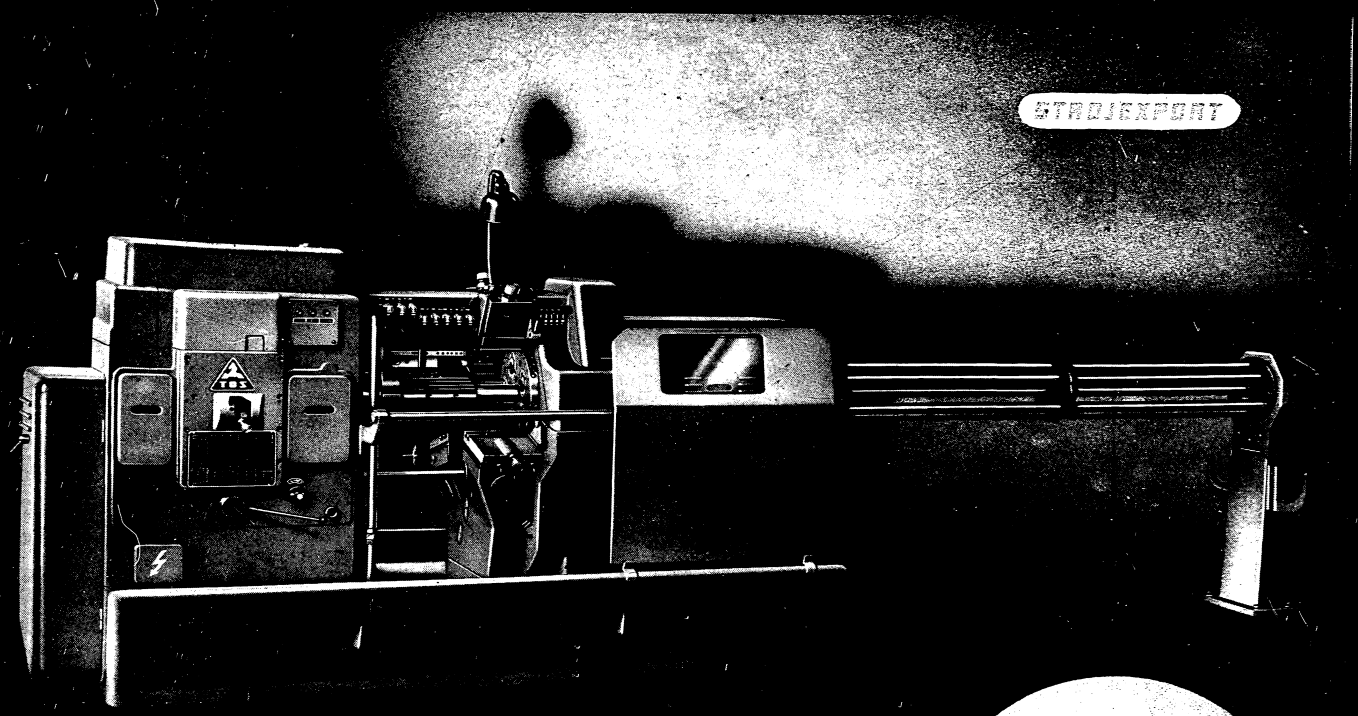

# AN 35

## FÜNFSPINDELAUTOMAT

Auf der Maschine werden alle Maschinenteile aus Werkstoffstangen bis zum max. Durchmesser von 35 mm hergestellt. Die hergestellten Teile können eine max. Länge von 100 mm haben. Die größtmögliche Anzahl der Arbeitsgänge ist 12. Die Maschine hat 5 Arbeitsspindeln mit einer Bohrung von 36 mm und fünf Quersupporte (von diesen ist ein Support für das Abstechen vorgesehen, der nur in der fünften Lage arbeitet) und drei Längssupporte. Die erforderlichen Stahlhalter, die in dem weiter angeführten Verzeichnis enthalten sind, werden in die T-Nuten der Supporte und des Fünfkants gespannt. Der Vorteil der Maschine besteht darin, daß für den hergestellten Maschinenteil keine besonderen Kurven benötigt werden und daß alle Arbeitshübe und Eilgänge durch Kurven erzielt werden, die in Standardausführung bereits in der Maschine einmontiert sind. Ihre verschiedenen Größen können durch einfaches Verstellen der Hebel nach einer an der Maschine befestigten Tabelle eingestellt werden. Das Einrichten der Maschine erfolgt daher auch bei kleinen oft wechselnden Serien rasch und wirtschaftlich.

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# SPECIFICATION

| | | | |
|---|---|---|---|
| **Chucking Range:** | | | |
| Maximum chucking diameter: | | | |
| for bar stock | mm | 34 | $1^{11}/_{32}''$ |
| for blanks in a chuck (for work with a smaller number of tools) | mm | 110 to 180 | $4^{21}/_{64}''$ to $7^{3}/_{32}''$ |
| Diameter of chuck (Vc 1 or Vc 2) | mm | 160 | $6^{10}/_{64}''$ |
| Maximum swing over bed: | | | |
| with thread chasing attachment | mm | 250 | $9^{27}/_{32}''$ |
| without thread chasing attachment | mm | 360 | 14″ |
| Maximum distance: | | | |
| turret head to main spindle flange | mm | 510 | 20″ |
| turret head to chuck for the bar stock | mm | 410 | 16″ |
| **Turret Head:** | | | |
| Diameter of pitch circle of tool holes | mm | 150 | 6″ |
| Number of tool holes | | 16 | |
| Number × diameter of tool holes | mm | 7 × 20 | $7 \times {}^{25}/_{32}''$ |
| | | 7 × 30 | $7 \times 1^{3}/_{16}''$ |
| (double hole) | mm | (2 × 35) | $(2 \times 1^{3}/_{8}'')$ |
| Maximum longitudinal travel of turret slide | mm | 410 | 16″ |
| **Speeds:** | | | |
| Number of speeds (forward and reverse) | | 50 | |
| Speed ranges (set by change gears supplied as standard equipment of machine): | | | |
| No. I range (with 10 steps) | r. p. m. | 56 to 1250 | |
| No. II range (with 10 steps) | r. p. m. | 71 to 1600 | |
| No. III range (with 10 steps) | r. p. m. | 90 to 2000 | |
| No. IV range (with 10 steps) | r. p. m. | 125 to 2500 | |
| No. V range (with 10 steps) | r. p. m. | 140 to 3150 | |
| **Feeds:** | | | |
| Number of longitudinal and cross feeds | | 6 | |
| Range of longitudinal feeds | mm per rev. | 0.056 to 0.56 | |
| | inches per rev. | | 0.0022″ to 0.022″ |
| Range of cross feeds | mm per rev. | 0.028 to 0.28 | |
| | inches per rev. | | 0.0011″ to 0.011″ |
| **Main Three Speed Electric Motor:** | | | |
| Permissible number of reversals (at 670 or 680 r. p. m.) | per hour | 120 | |
| Speed | r. p. m. | 680 to 2800 | |
| Maximum output at full utilization of machine | kW | 9 | |
| **[illegible] and Weights:** | | | |
| [illegible] stock feed attachment) | mm | 2250 × 950 | [illegible] |
| [illegible] with stock feed attachment and stands [illegible] | mm | 5550 | [illegible] |
| [illegible] | mm | 1000 | [illegible] |
| [illegible] | kg | 1300 | [illegible] |

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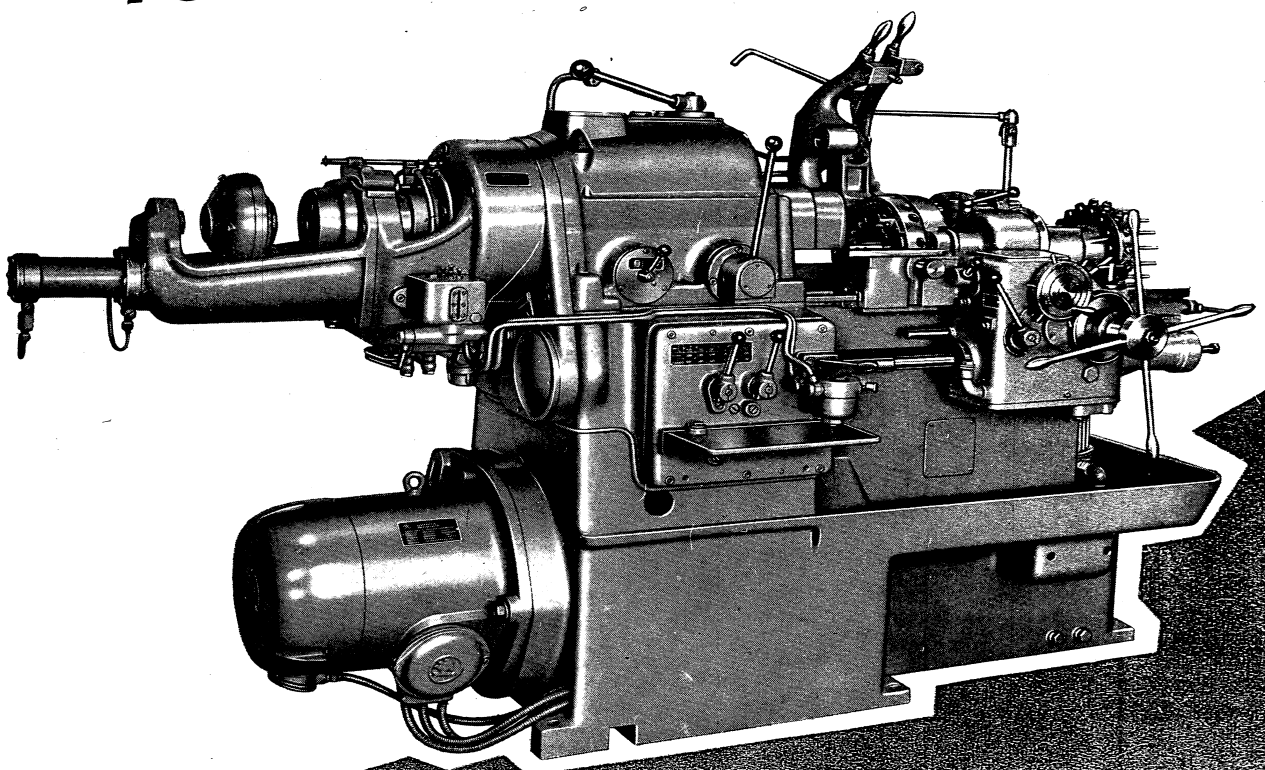
# TURRET LATHE



TYPE

# RN 36

ŠKODA

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# Specification

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| **Type** | | | **S 1600 D2** | | | **S 2150 D2** | |
| **WORKING RANGE** | | | | | | | |
| **Maximum swing over bed** | mm | 1600 | 5′ 3″ | mm | 2150 | 7′ 0½″ | |
| **over carriage** | mm | 1200 | 3′ 11″ | mm | 1700 | 5′ 6½″ | |
| **Height of centers above bed** | mm | 800 | 2′ 7½″ | mm | 1050 | 3′ 5″ | |
| **Distance, center to center** | metres | 6, 8, 10, 12 | | 19′ 8″, | 26′ 3″, | 32′ 9″, | 39′ 4″ |
| **Maximum weight of workpiece between centers (without steadies)** | kg | 20000 | | 61700 lbs | | | |
| **Maximum torque on face plate** | cmkg | 700000 | | 50000 ft. lbs | | | |
| **HEADSTOCK** | | | | | | | |
| **Spindle speeds arranged in 24 steps** | r. p. m. | 0.71 to 140 | | 0.45 to 90 | | | |
| **Taper in front end of spindle** | | Metric 100 | | | | | |
| **Diameter of spindle in front bearing** | mm | 315 | | 12⁴⁹/₆₄″ | | | |
| **Diameter of face plate** | mm | 1580 | 5′ 2″ | mm | 2000 | 6′ 6″ | |
| **CARRIAGE** | | | | | | | |
| **32 longitudinal feeds arranged in 2 ranges:** | | | | | | | |
| **1st range — 16 feeds at all spindle speeds** | mm per rev. | 0.12 to 5.6 | | 0.007″ to 0.112″ per rev. | | | |
| **2nd range — 16 feeds at lower spindle speeds** | mm per rev. | 1.4 to 45 | | 0.056″ to 1.8″ per rev. | | | |
| **32 cross feeds** | mm per rev. | 0.07 to 15 | | 0.003″ to 0.72″ per rev. | | | |
| **Rapid traverse** | mm per min. | 3000 | | 10′ per min. | | | |
| **SCREWCUTTING BY MEANS OF CHANGE GEARS** | | | | | | | |
| **Pitch of leadscrew** | t. p. i. | 2 | | | | | |
| **35 metric threads, pitch** | mm | 1 to 50 | | | | | |
| **35 Whitworth threads** | t. p. i. | 24 to ½ | | | | | |
| **Steep threads, pitch** | | 8 times normal | | | | | |
| **Number of change gears** | | 19 | | | | | |
| **TAILSTOCK** | | | | | | | |
| **Diameter of tailstock sleeve** | mm | 200 | | 7⅞″ | | | |
| **Taper in tailstock sleeve** | | Metric 100 | | | | | |
| **Rapid movement on bed** | mm per min. | 3500 | | 9′ 2″ per min. | | | |
| **Rapid movement of tailstock sleeve** | mm per min. | 1400 | | 4′ 10″ per min. | | | |
| **FIXED STEADY** | | | | | | | |
| **Maximum clear diameter** | mm | 800 | 2′ 7½″ | mm | 1000 | 3′ 3″ | |
| **DRIVE** | | | | | | | |
| **Main motor:** | | | | | | | |
| **output** | kW | 55 | | | | | |
| **speed** | r. p. m. | 980 | | | | | |
| **Motor for rapid traverse of carriage:** | | | | | | | |
| **output** | kW | 2.5 | | | | | |
| **speed** | r. p. m. | 1430 | | | | | |
| **Motor for rapid movement of tailstock on bed:** | | | | | | | |
| **output** | kW | 1.8 | | | | | |
| **speed** | r. p. m. | 1430 | | | | | |
| **Motor for rapid movement of tailstock sleeve:** | | | | | | | |
| **output** | kW | 0.5 | | | | | |
| **speed** | r. p. m. | 2770 | | | | | |
| **WEIGHTS AND DIMENSIONS** | | | | | | | |
| **Weight of machine with one complete carriage and standard equipment:** | | | | | | | |
| **for 6000 mm (19′ 8″) between centres, approx.** | kg | 44500 | 98100 lbs | kg | 48500 | 106900 lbs | |
| **for 8000 mm (26′ 3″) between centres, approx.** | kg | 48500 | 106900 lbs | kg | 53000 | 116900 lbs | |
| **for 10000 mm (32′ 9″) between centres, approx.** | kg | 52500 | 115800 lbs | kg | 57500 | 126800 lbs | |
| **for 12000 mm (39′ 4″) between centres, approx.** | kg | 56500 | 124600 lbs | kg | 62000 | 136700 lbs | |
| **Distance, centre to centre, minimum** | mm | 6000 | | 19′ 8″ | | | |
| **Overall length of machine** | | | | | | | |
| **for 6000 mm (19′ 8″) between centres, approx.** | mm | 11400 | 37′ 5″ | mm | 11900 | 39′ 0″ | |
| **for 8000 mm (26′ 3″) between centres, approx.** | mm | 13400 | 44′ | mm | 13900 | 45′ 4″ | |
| **for 10000 mm (32′ 9″) between centres, approx.** | mm | 15400 | 50′ 6″ | mm | 15900 | 51′ 10″ | |
| **for 12000 mm (39′ 4″) between centres, approx.** | mm | 17400 | 57′ 2″ | mm | 17900 | 58′ 5″ | |
| **for 16000 mm (52′ 6″) between centres, approx.** | mm | 21400 | 70′ 4″ | mm | 21900 | 72′ 8″ | |

**PLEASE STATE IN YOUR ORDER THE VOLTAGE AVAILABLE FOR THE ELECTRIC MOTORS!**

The machines are continuously being improved upon. The data given in this prospectus are therefore not binding in detail.

**STROJEXPORT** - PRAHA - CZECHOSLOVAKIA

ČOK 52640 a - 5409

Printed in Czechoslovakia

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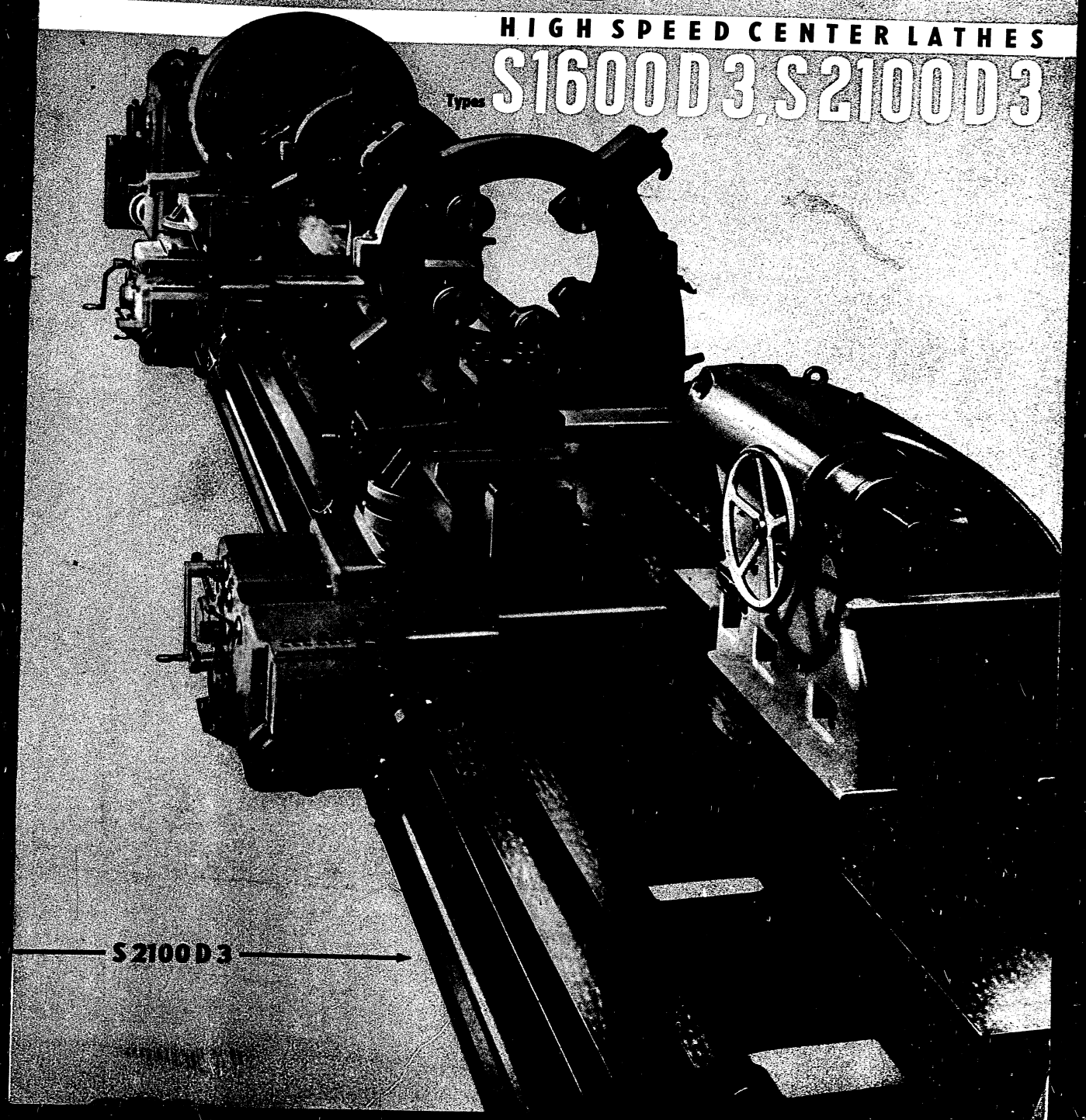
ŠKODA

HIGH SPEED CENTER LATHES

Types S1600D3, S2100D3



S2100D3

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| Type | | SR 1000 | | SR 1250 | |
|---|---|---|---|---|---|
| **Working Range:** | | | | | |
| Swing over bed | mm | 1000 | 3′3″ | 1250 | 4′1″ |
| Swing over carriage | mm | 710 | 2′4″ | 900 | 2′11″ |
| Height of centers above bed | mm | 500 | 1′8″ | 630 | 2′1″ |
| Distance between centers to be specified in order | mm | 3000 to 12000 | | 9′10″ to 39′4″ | |
| Maximum weight of workpiece without rests | tons | 9 to 10 | | 13 to 14 | |
| Output of main motor | kW | 34 | | 34 | |
| Maximum torque on face plate at 11.2 r. p. m. of spindle | mkg | 2500 | 18800-ft-lbs | 3150 | 22800-ft-lbs |
| **Headstock:** | | | | | |
| Spindle speeds arranged in 36 steps: | | | | | |
| No. I Range | r. p. m. | 1.8 to 90 | | 1.4 to 71 | |
| No. II Range | r. p. m. | 8 to 400 | | 6.3 to 315 | |
| Taper in front end of spindle | | No. 6 Morse | | Metric 80 | |
| Diameter of spindle in front bearing | mm | 200 | 7″⁷/₈ | 240 | 9″⁷/₁₆ |
| Diameter of face plate | mm | 1000 | 3′3″ | 1250 | 4′1″ |
| **Carriage:** | | | | | |
| Longitudinal feeds arranged in 36 steps: | | | | | |
| No. I Range — 18 rates of feed at all spindle speeds mm per rev. | | 0.25 to 6 | 0.01″ to 0.24″ per rev. | | |
| No. II Range — 18 rates of feed at lower range of spindle speeds mm per rev. | | 1 to 48 | 0.04″ to 1.92″ per rev. | | |
| Cross feeds and tool slide feeds are equal to 0.4 x longitudinal feeds | | | | | |
| Cross section of tool for standard tool post | mm | 70×70 | 2³/₄″×2³/₄″ | | |
| Cross section of tool for four-way tool post | mm | 48×48 | 1⁷/₈″×1⁷/₈″ | | |
| Longitudinal rapid traverse mm per min. | | 3600 | 11′10″ per min. | | |
| Screwcutting by means of lead screw: | | | | | |
| Thread of lead srew | threads per inch | 2 | | | |
| 29 metric threads, pitch | mm | 1 to 50 | | | |
| 33 Whitworth threads | threads per inch | 24 to ½ | | | |
| 11 module threads, module | | 2 to 5 | | | |
| 21 diametral pitch threads | D. P. | 1 to 10 | | | |
| 32 circular pitch threads | C. P. | 2 to ⅓ | | | |
| Ratio, standard to steep thread | | 1 : 8 | | | |
| Screwcutting by means of pinion and rack: | | | | | |
| 29 metric threads, pitch | mm | 1 to 50 | | | |
| 26 module threads, module | | 2 to 20 | | | |
| **Tailstock:** | | | | | |
| Diameter of tailstock sleeve | mm | 140 | 5½″ | 160 | 6″¹⁹/₆₄ |
| Taper in tailstock sleeve | | No. 6 Morse | | Metric 80 | |
| **Steady Rest:** | | | | | |
| Clear diameter | mm | 500 | 1′8″ | 630 | 2′1″ |
| **Drive:** | | | | | |
| Main motor: output | kW | 34 | | | |
| speed | r. p. m. | 1440 | | | |
| Motor for rapid traverse of carriage slide: | | | | | |
| output | kW | 1.3 | | | |
| speed | r. p. m. | 2880 | | | |
| Motor for lubricating oil pump: | | | | | |
| output | kW | 0.185 | | | |
| speed | r. p. m. | 2800 | | | |
| **Weights and Dimensions:** | | | | | |
| Distance between centers (basic) | mm | 3000 | | 9′10″ | |
| Overall length of machine, approx. | mm | 6500 | 21′4″ | 6700 | 22′0″ |
| Weight of machine with standard equipment | kg | 13335 | 29400 lbs | kg 14960 | 32980 lbs |
| A 1000 mm (39″) increase of center-to-center distance increases weight approx. by | kg | 635 | 1400 lbs | kg 780 | 1720 lbs |

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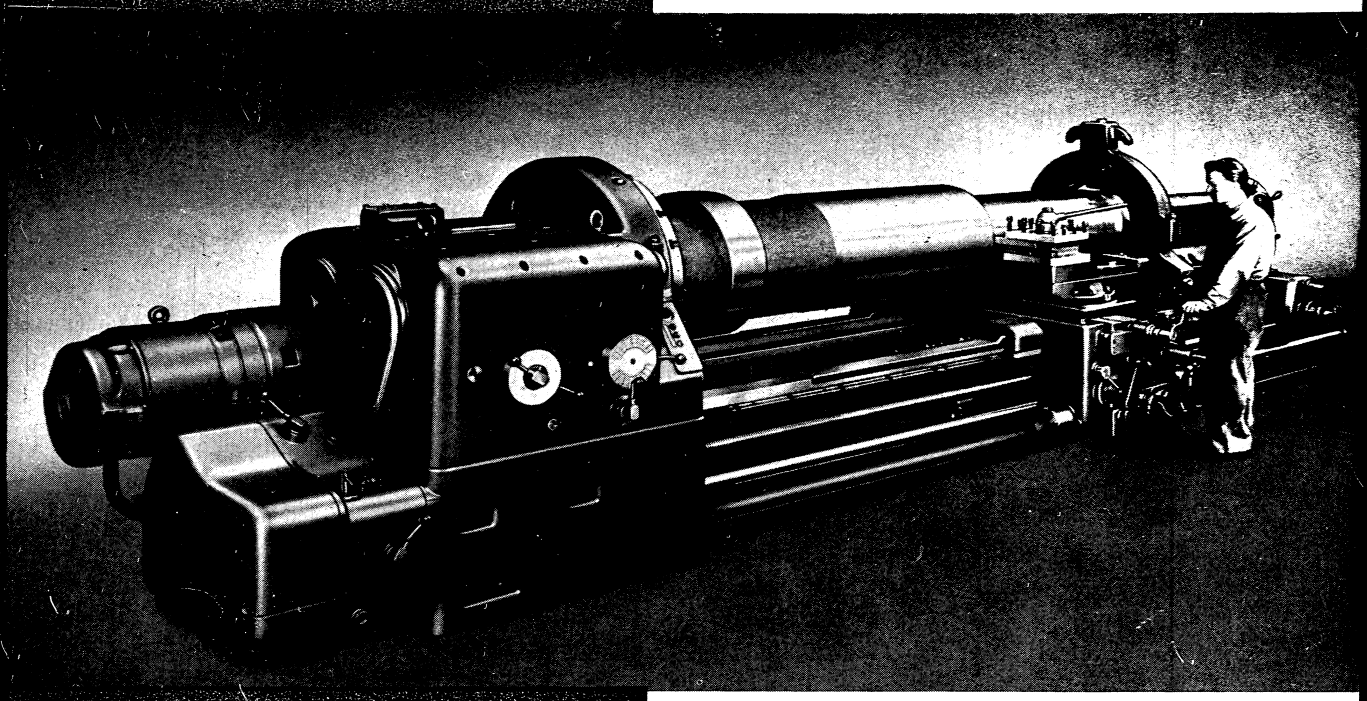

# SR1000

TYPES

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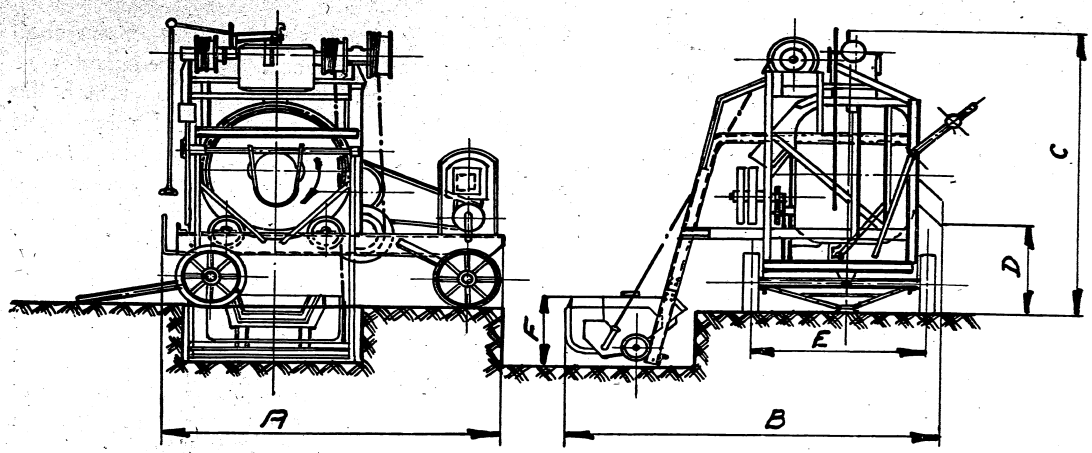


# TECHNICAL DATA

| A | B | C | D | E | F |
|---|---|---|---|---|---|
| 4200 | 4250 | 4020 | 1250 | 2050 | 1140 |

| | |
|---|---|
| Capacity | 750 l ; 165 gal. |
| Output (20 fillings) | 13,5 cu. m/hr. (480 cu. ft.) |
| Speed of the mixing drum | 13 r. p. m. |
| Electric motor | 15—20 HP |
| | 1.450 r. p. m. |
| | 380/660 V |
| Diesel engine | 15—20 HP |
| Approximate weight | 4850 kg ; 95 cwt. |

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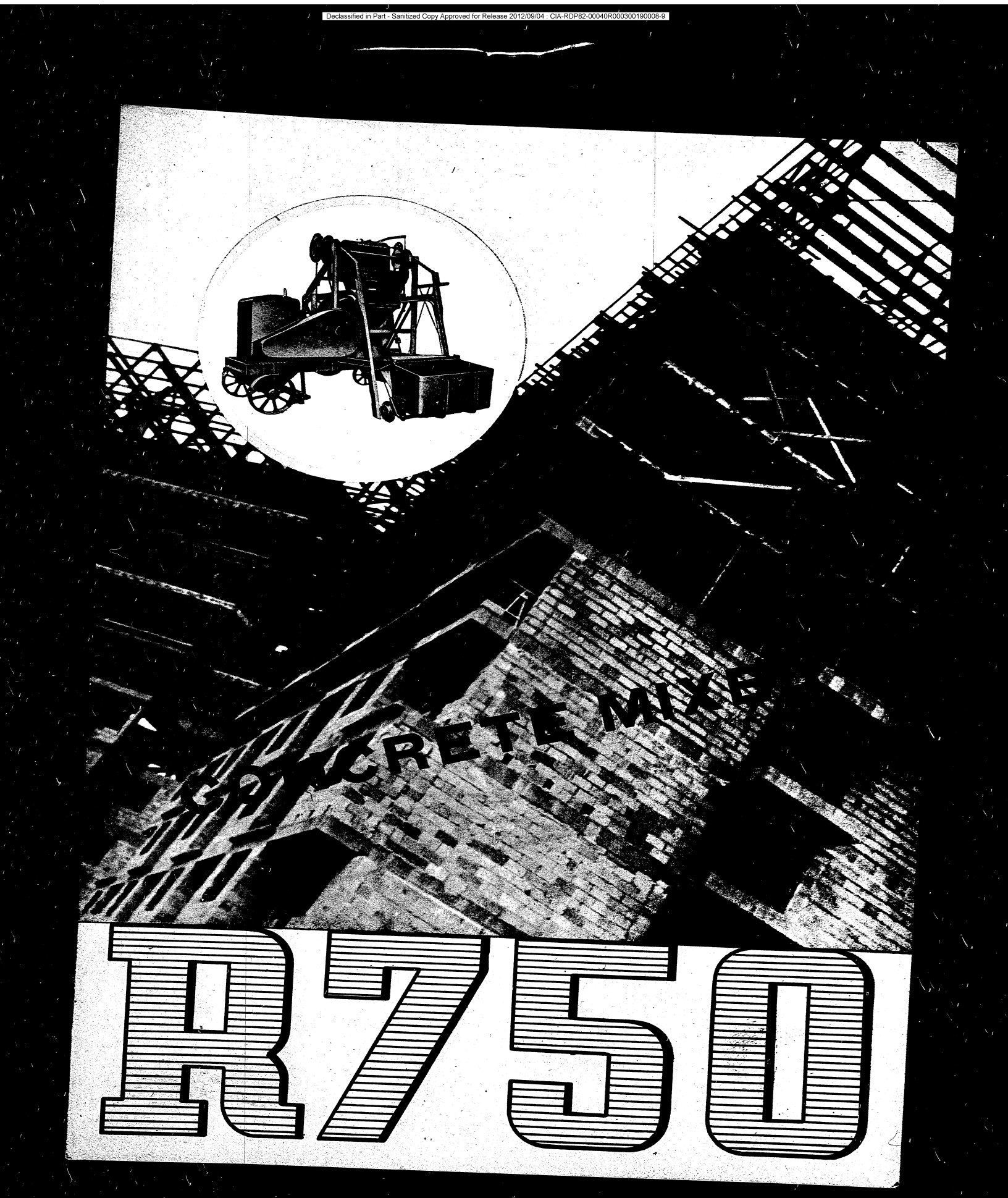


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## Specification

| Working Range: | | Metric | English |
|---|---|---|---|
| Maximum swing when turning with side arm | mm | 1250 | 4'1" |
| Maximum swing when turning with rail arm (with side arm lowered below table) | mm | 1350 | 4'5" |
| Maximum vertical distance, tool holder of side arm to table | mm | 850 | 2'9½" |
| Maximum vertical distance, tool holder of rail arm to table | mm | 1000 | 3'3½" |
| Vertical travel of rail arm slide | mm | 710 | 2'4" |
| Vertical travel of turret arm slide | mm | 550 | 1'9½" |
| Horizontal travel of side arm slide | mm | 500 | 1'7½" |
| Maximum weight of work piece | kg | 4000 | 8820 lbs |
| Maximum torque on table | kgm | 2250 | 16280 ft-lbs |
| Overall dimensions of machine: | | | |
| length | mm | 3850 | 12'7½" |
| width | mm | 2500 | 8'2½" |
| height | mm | 4250 | 13'11½" |
| Overall dimensions of contactor box: | | | |
| length | mm | 1050 | 3'5½" |
| width | mm | 800 | 2'7½" |
| height | mm | 1800 | 5'11" |
| **Table:** | | | |
| Diameter of table | mm | 1180 | 3'10½" |
| Infinitely variable speed of table arranged in four ranges, for clockwise as well as counterclockwise rotation: | | | |
| range I | r. p. m. | 3.55 to 14 | |
| range II | r. p. m. | 7.7 to 31 | |
| range III | r. p. m. | 16.8 to 68 | |
| range IV | r. p. m. | 37 to 150 | |
| Power of main motor within range of table speed: | | | |
| from 3.5 to 8 r. p. m. | kW | 12 to 27 | |
| from 8 to 150 r. p. m. | kW | 27 to 37 | |
| **Feeds:** | | | |
| Number of feeds | | 24 | |
| Rate of feed, vertical as well as horizontal, per table revolution (independent for tool arm on either side of machine) | mm per rev. | 0.06 to 9 | 0.0024" to 0.36" per min. |
| **Main Drive:** | | | |
| Variable speed commutator motor: | | | |
| Power at 2300 to 1800 r. p. m. | kW | 3.7 | |
| Power at 1800 to 580 r. p. m. | kW | 12 | |
| Total weight of machine in standard design, approx. | kg | 15800 | 34800 lbs |

PLEASE STATE IN YOUR ORDER THE VOLTAGE AVAILABLE FOR THE ELECTRIC MOTORS.
The machines are continuously being improved upon. The data given in this prospectus are therefore not binding in detail.

**STROJEXPORT**

**PRAHA - CZECHOSLOVAKIA**

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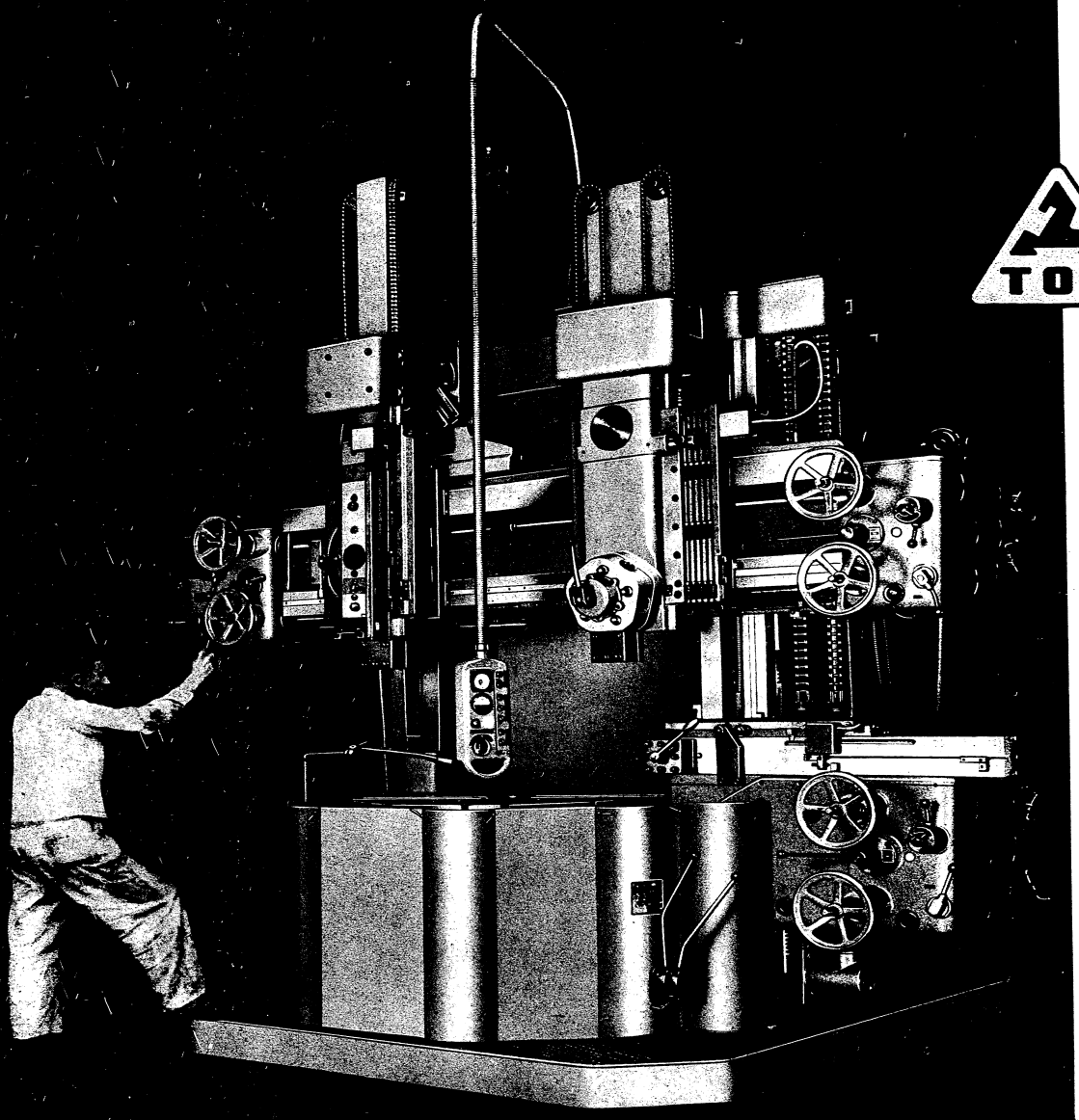

TOS

# VERTICAL TURNING AND BORING MILL MODEL

# SK 12

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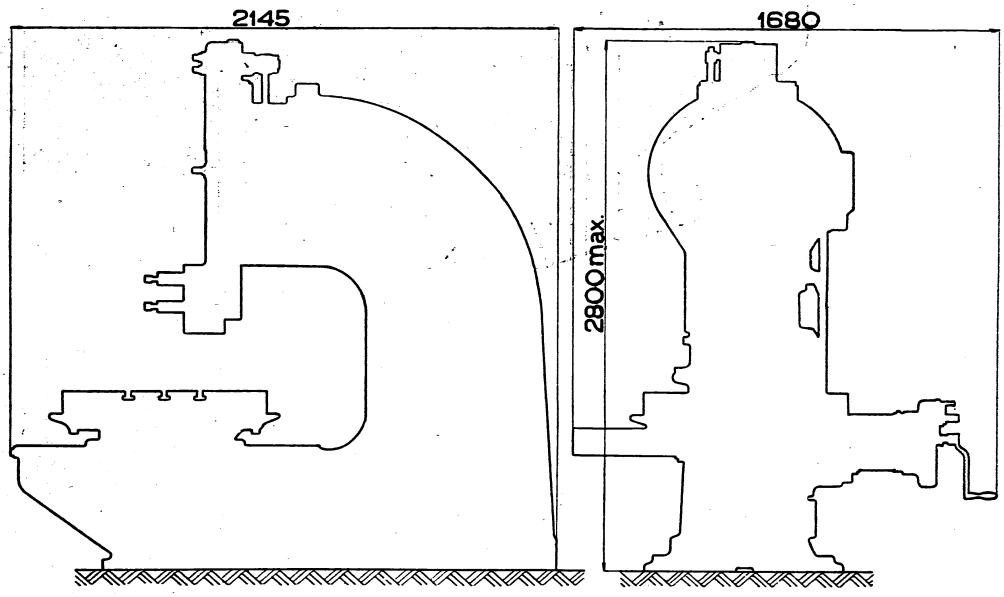
**STANDARD EQUIPMENT:** Electric motor with electrical equipment, 2 tool boxes, set of service spanners, base plate for motor, V-belts, motor pulley, indexing attachment, operator's instruction booklet.

## SPECIFICATIONS

| | | Metric | English |
|---|---|---|---|
| Maximum length of stroke | mm | 350 | 14″ |
| Diameter of rotary table | mm | 800 | 31½″ |
| Cross travel of table | mm | 650 | 25½″ |
| Longitudinal travel of table | mm | 650 | 25½″ |
| Distance, tool edge to column | mm | 700 | 27½″ |
| Distance, tool edge to ram guides | mm | 215 | 8½″ |
| Distance, table to ram guides | mm | 560 | 22″ |
| Number of speeds | | 6 | 6 |
| Number of strokes per minute (up and down) | | 10—56 | 10—56 |
| Feeds: 6 longitudinal and cross feeds, infinitely variable | stroke/mm | 0—2 | 0—0,08″ |
| Motor: Speed | r. p. m. | 1400 | 1400 |
| Output | HP | 5,5 | 5,5 |
| Floor space required | mm | 1700 × 2150 | 67″ × 85″ |
| Weight of machine: with standard equipment | kg | 3880 | 8540 lbs |
| with railway packing | kg | 3980 | 8800 lbs |
| with seaworthy packing | kg | 4600 | 10.000 lbs |
| Contents boxed | $m^3$ | 10 | 355 cu. ft. |

WHEN ORDERING, SPECIFY VOLTAGE, PHASE AND FREQUENCY OF POWER SUPPLY!




**As improvements in design are continually being made, this specification is not to be regarded as binding in detail, and dimensions are subject to alteration without notice.**

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ČOK 52925 a - 5501

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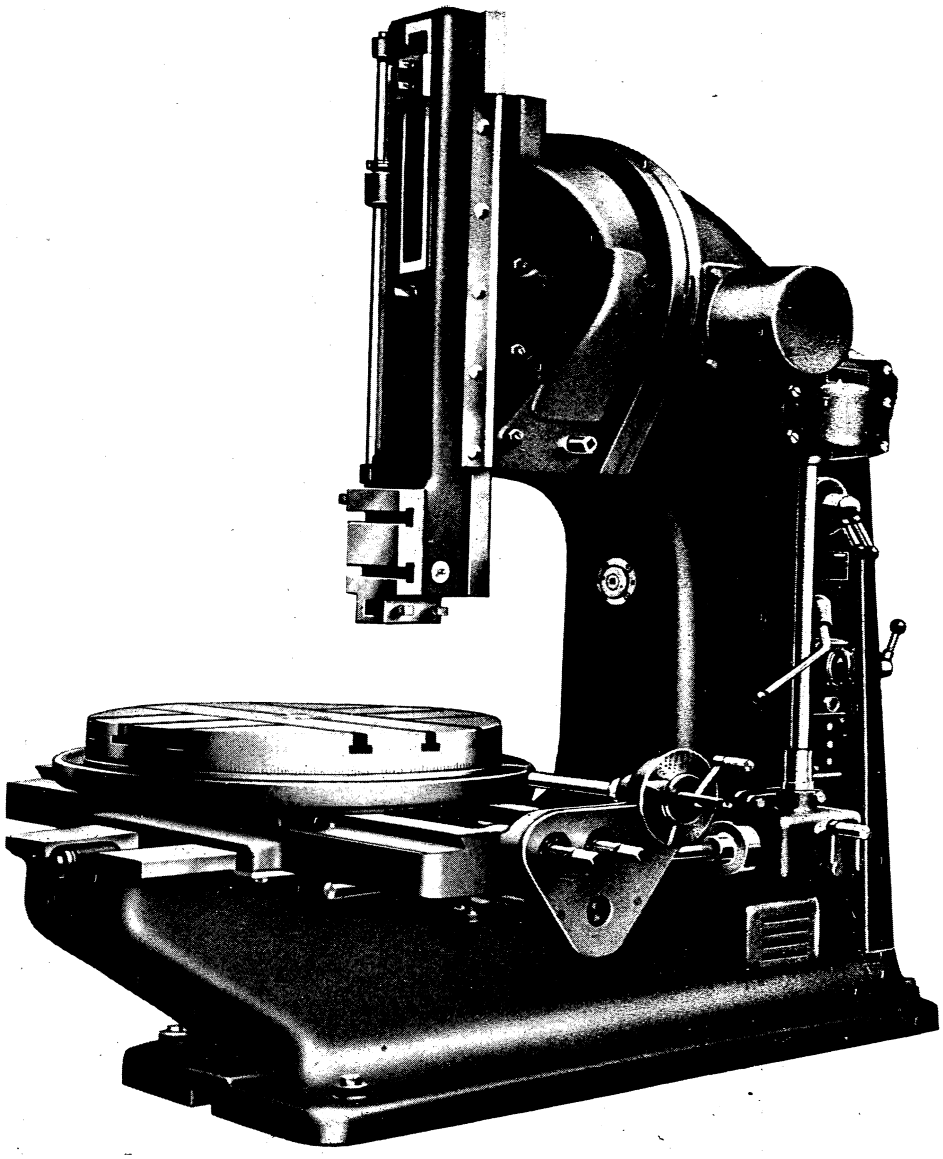

# SLOTTING MACHINE MODEL ST 350

**THE DRIVE** is by V-belts from an electric motor through a 6-speed gear box and link mechanism. Starting and stopping of the machine is effected by a multiple disc clutch with brake which enables the stopping of ram in any position.

**THE RAM** is vertically adjustable up to 400 mm, has flat guideways and may be tilted to a maximum of 10° in both directions. Its accurate setting is done by means of a vernier. The tool is lifted automatically.

**THE ROTARY TABLE** rests on a compound slide which is guided within V-ways on the knee. On its circumference the table is provided with a dial graduated in degrees for indicating the angular setting. In the centre of the table is a hole for the central mandrel which is employed for circular cutting. The table is accurately indexed by a built-in hand-operated indexing attachment. The longitudinal, cross and circular feed of the table is by hand and by power. The feed range and feed direction can be changed while cutting. The table surface is provided with T-slots for clamping the work.

350

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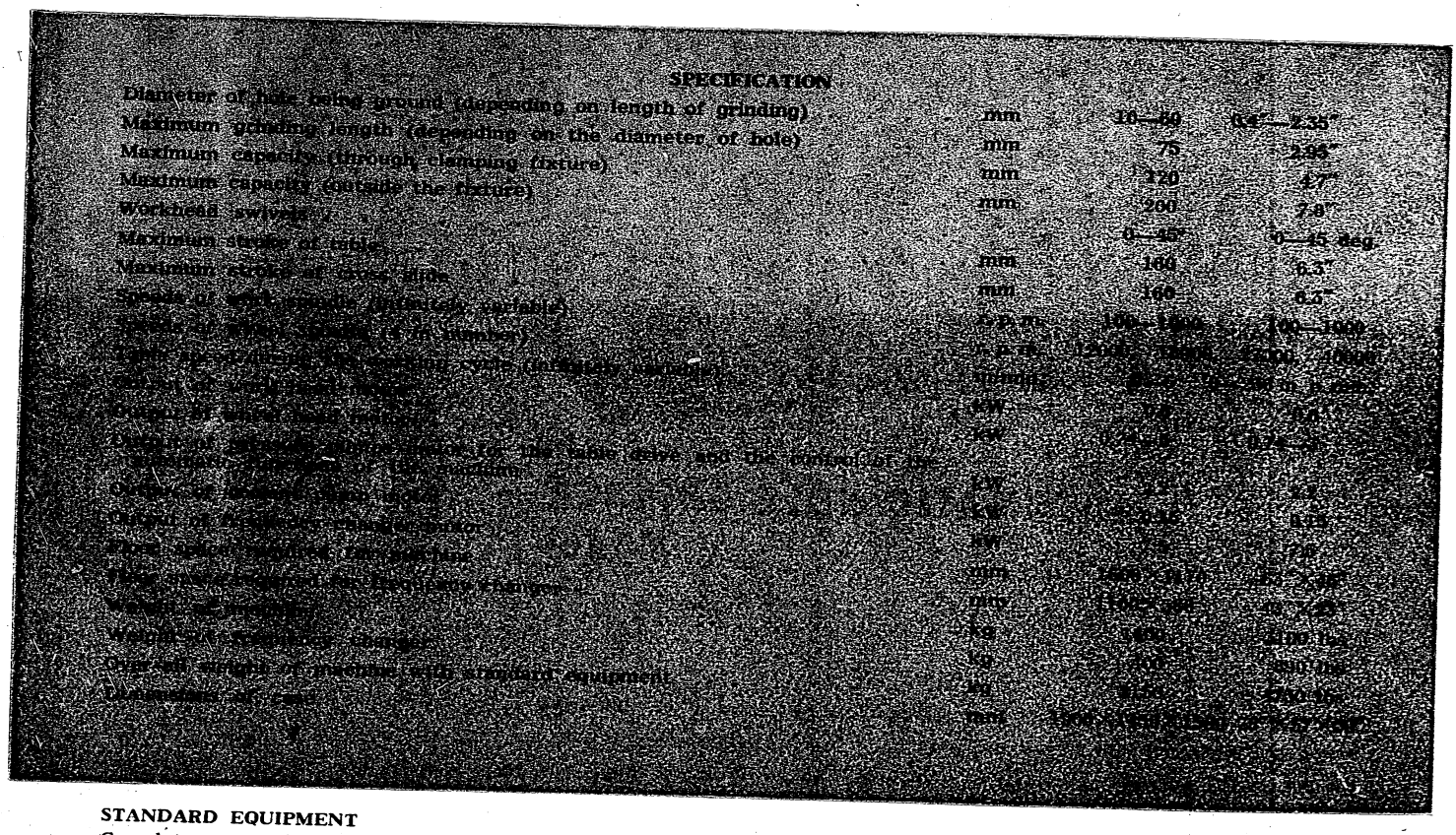
**The Automatic Wheel Trueing Device** is mounted on the rear of the work spindle.

**The Controlling Mechanism** of the table drive and of the automatic functions of the machine is incorporated in the box on the front of the column. The functions of all controls are given on operating plates. After having been correctly set-up the machine can be operated by an unskilled worker.

**The Wheel Head** rests on the longitudinal table and the wheel spindle rotating in precision bearings carries the armature of a high-speed electric motor. By this direct drive all undesirable influences caused by transmission gears are eliminated and thus a high-quality surface finish is obtained.

**The Frequency Changer** supplying electric current of a higher frequency to the wheel spindle motor is incorporated in a separate box which can be located in another room to save the floor space.



## SPECIFICATION

| | | | |
|---|---|---|---|
| Diameter of hole being ground (depending on length of grinding) | mm | 10—60 | 0.4"—2.35" |
| Maximum grinding length (depending on the diameter of hole) | mm | 75 | 2.95" |
| Maximum capacity (through clamping fixture) | mm | 120 | 4.7" |
| Maximum capacity (outside the fixture) | mm | 200 | 7.8" |
| Workhead swivels | | 0—45° | 0—45 deg. |
| Maximum stroke of table | mm | 160 | 6.3" |
| Maximum stroke of cross slide | mm | 160 | 6.3" |
| Speeds of work spindle (infinitely variable) | r.p.m. | 100—1000 | 100—1000 |
| Speeds of wheel spindle (4 in number) | r.p.m. | 12000, [illegible] | 12000, 40000 |
| Table speed during the working cycle (infinitely variable) | m/min | [illegible] | [illegible] |
| Output of work head motor | kW | [illegible] | [illegible] |
| Output of wheel head motor | kW | [illegible] | [illegible] |
| Output of [illegible] motor for the table drive and the control of the automatic functions of the machine | kW | [illegible] | [illegible] |
| Output of [illegible] motor | kW | [illegible] | [illegible] |
| Output of frequency changer motor | kW | [illegible] | [illegible] |
| Floor space required for machine | mm | [illegible] | [illegible] |
| Floor space required for frequency changer | mm | [illegible] | [illegible] |
| Weight of machine | kg | [illegible] | [illegible] |
| Weight of frequency changer | kg | [illegible] | [illegible] |
| Over-all weight of machine with standard equipment | kg | [illegible] | [illegible] |
| Dimensions of case | mm | [illegible] | [illegible] |

**STANDARD EQUIPMENT**

| | |
|---|---|
| Complete extended wheel spindle | 1 complete |
| Various extensions with grinding wheels | 3 pieces |
| Diamond bracket (less diamond) | 1 piece |
| Feeding cams for grinding allowances of 0.3 — 0.45 — 0.6 mm on the dia. | 3 pieces |
| Set of spanners and grease gun | |
| Operator's instruction booklet | |

**OPTIONAL EQUIPMENT**

| | |
|---|---|
| 3-jaw quick-clamping chuck with 6 sets of change jaws for clamping diameters of 10—60 mm | 1 complete |

**IN ORDERING, SPECIFY VOLTAGE, PHASE AND FREQUENCY OF POWER SUPPLY.**

As improvements in design are continually being made, this specification is not to be regarded as binding in detail, and dimensions are subject to alteration without notice.

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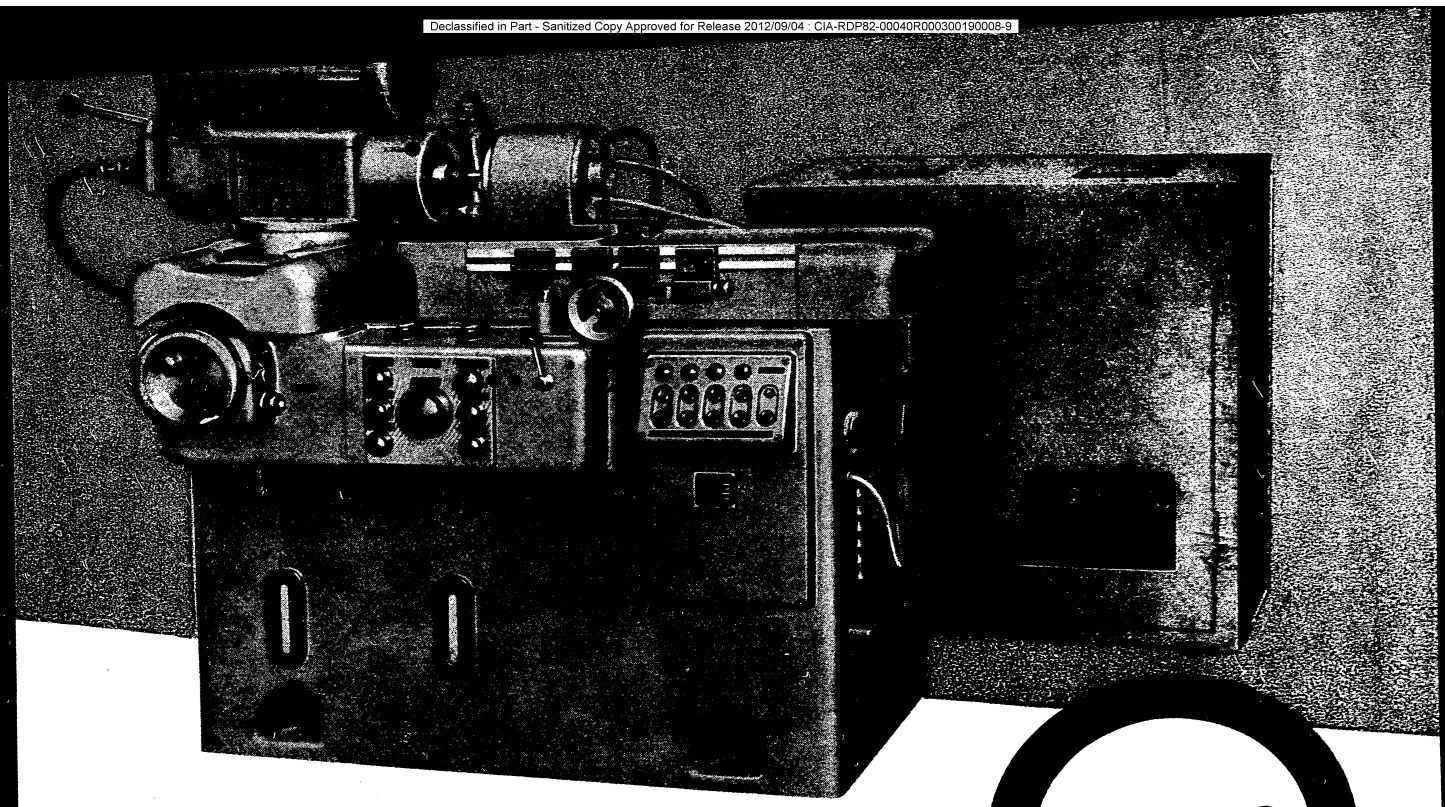

# AUTOMATIC HOLE GRINDER
## Model

**BDA 20**

This Heavy Duty Precision Machine is adapted to the grinding of cylindrical holes up to dia. 60 mm and maximum length of 75 mm as well as to the grinding of tapered holes up to 90 deg.

The automatic working cycle and the automatic checking of the dimensions being ground make the machine especially suitable for the grinding of holes in the quantity production. However, the ease of adjustment of the machine enables the economical grinding also in smaller lots or even in the single part production.

The ingenious design with the new mounting of both tables ensuring an accurate and smooth running of the machine, the careful selection of all materials and the accurate mechanical and heat-treatment of all parts guarantee the high precision and reliability in service of the machine.

**GENERAL DESCRIPTION**

**The Column** is of the boxed type and incorporates both the oil and the coolant tank.

**The Longitudinal and the Cross Slide** move in special multi-row ball bearings on accurately ground cylindrical bars ensuring high precision and smooth running.

**The Work Head** is mounted on the cross slide which enables it to be moved aside for reloading the machine or for measuring the workpiece. Also the table stroke is fully utilized, in this way. The work spindle rotates in adjustable plain bearings and is provided with a standardized flange for attaching any type of chuck or clamping fixture. The spindle is driven by an infinitely variable motor.

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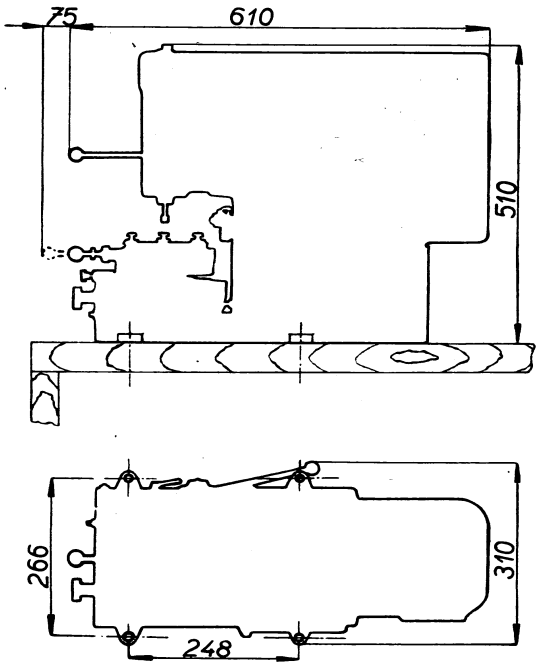
## Specifications

| | | Metric | English |
|---|---|---|---|
| Maximum dimensions of the die: External dia | mm | 75 | 2.95″ |
| Metric thread | | M 42 | — |
| Whitworth thread | | — | 1 5/8″ |
| Spindle speeds | r. p. m. | 24000 | 24000 |
| Stroke of spindle | mm | 60 | 2.36″ |
| Cross/longitudinal feed of die-holder | mm | 32/50 | 1.26″/2″ |
| Number of graduations on the die-holder | | 3, 4, 5, 6 | 3, 4, 5, 6 |
| Die-holder swivels up to | | ± 20° | ± 20 deg. |
| Trueing device swivels up to | | 0°, 30°, 45° | 0, 30 45 deg. |
| Diameter of diamond-holder | mm | 6 | 0.236″ |
| Motor: Output | HP | 0,75 | 0.75 |
| Speed | r. p. m. | 2770 | 2770 |
| Speed of dust exhaust fan | r. p. m. | 8000 | 8000 |
| Overall height of machine | mm | 510 | 20″ |
| Floor space required | mm | 310 × 610 | 12.2″ × 24″ |
| Weight of machine | kg | 65 | 144 lbs. |
| Weight of machine with packing | kg | 85 | 188 lbs. |
| Contents boxed | $m^3$ | 0,20 | 7 cu. ft. |

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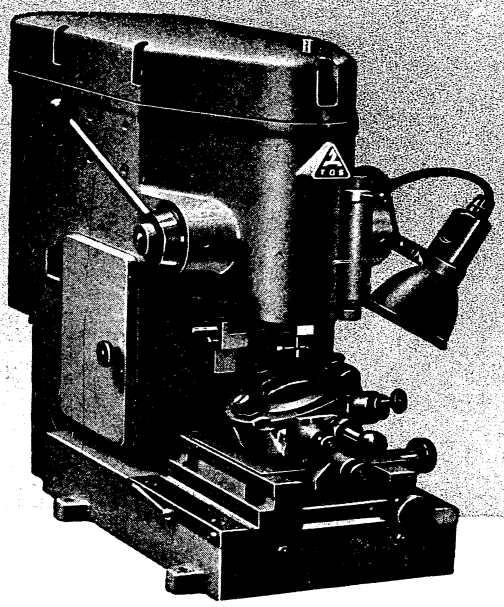

# THREADING DIE GRINDER

**Model**

**BNO**

**This Heavy Duty Precision Machine is intended for the grinding of all types of thread cutting dies, to prolong their life and increase their utilisation.**

**THE WHEEL SPINDLE** rotates in three pairs of angular-contact ball bearings and is driven by an endless woven texrope from the countershaft. The spindle speed is approx. 24.000 r. p. m. The grinding wheels are employed in a size to suit the dimensions of the dies to be ground and are clamped in the spindle by means of a collet.

**THE DIE-HOLDER** is brought into its working position by the longitudinal and cross feed. The dies are clamped in the die-holder head directly or by using inserts. The head swivels ± 20 deg. according to a scale.

**THE WHEEL TRUEING DEVICE** is provided for dressing or tapering the wheel by means of the diamond.

**THE DUST EXHAUST ATTACHMENT** is arranged for exhausting the dust from the die-holder head or from the trueing device. The dust is collected in the dust separator from where it is removed after a certain time.

**THE DRIVE** is by a self-contained electric motor. The power is transmitted by 2 V-belts through the countershaft which is coupled to the dust exhaust attachment. The motor switch is located on the right-hand side of the machine.

**THE BULB** on a slewing arm gives sufficient light in all directions.

**STANDARD EQUIPMENT:** Electric motor with switch and fuses, trueing device (less diamond), dust exhaust attachment, 3 grinding wheels dia. 3, 6 and 8 mm, spot light, set of spanners, operator's instruction booklet.

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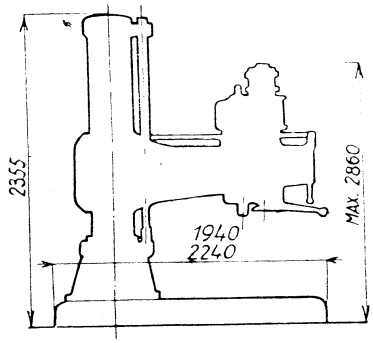
# SPECIFICATIONS:

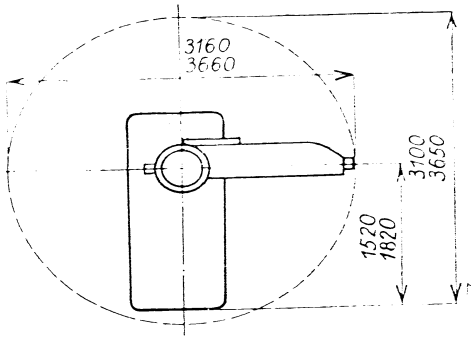
| | | Metric | English |
|---|---|---|---|
| **CAPACITY:** | | | |
| Maximum diameter when drilling steel having a tensile strength of 60 kg per square mm | mm | 40 | 1.57'' |
| Maximum diameter when drilling cast iron having a tensile strength of 25 kg per square mm | mm | 50 | 2'' |
| Maximum diameter when boring steel having a tensile strength of 60 kg per square mm | mm | 90 | 3.5'' |
| Maximum diameter when boring cast iron having a tensile strength of 25 kg per square mm | mm | 100 | 3.93'' |
| Maximum diameter when boring cast iron having a tensile strength of 60 kg per square mm | | M 24 | 1'' |
| Maximum size of thread cut in steel having a tensile strength of 60 kg per square mm | | M 36 | 1.5'' |
| Maximum size of thread cut in cast iron having a tensile strength of 25 kg per square mm | | | |
| **MAIN DIMENSIONS:** | | | |
| Maximum distance, centre-line of spindle to sleeve | mm | 1255 | 49'' |
| Minimum distance, centre-line of spindle to sleeve | mm | 310 | 12'' |
| Maximum pitch circle of drilled holes | mm | 2830 | 111'' |
| Minimum pitch circle of drilled holes | mm | 935 | 36.8'' |
| Maximum and minimum distance, spindle to base | mm | 1300 260 | 51''/10.2'' |
| Maximum and minimum distance, spindle to table | mm | 750 0 | 29.5''/0'' |
| Diameter of column | mm | 315 | 12.4'' |
| Vertical movement of arm on column | mm | 710 | 28'' |
| Horizontal movement of spindle head on arm | mm | 945 | 37'' |
| Swing of arm on column | | | 0°—360° |
| **SPINDLE:** | | | |
| Diameter of end of spindle | mm | 70 | 2.76'' |
| Taper in spindle | Morse | 4 | 4 |
| Diameter of spindle | mm | 35 | 1.38'' |
| Stroke of spindle | mm | 310 | 12.2'' |
| Spindle speeds: Number of steps | | 12 | 12 |
| standard range | r. p. m. | | 45—2000 |
| lower range | r. p. m. | | 31—1400 |
| increased range | r. p. m. | | 63 2800 |
| Spindle feeds: Number | | 10 | 10 |
| range | mm per rev. | 0,025—1,5816 | 1010 cuts p. in. |
| **BASE:** | | | |
| Working surface | mm | 1475×900 | 57.5''×35.5'' |
| Number, width and distance of T-slots | mm | 3×25×190 | 3×0.98''×7.45'' |
| **DRIVE:** | | | |
| Drilling motor: output/speed | kW/r. p. m. | | 3/1410 |
| Elevating motor: output/speed | kW/r. p. m. | | 1,1/1390 |
| Coolant pump motor: output/speed | kW/r. p. m. | | 0,125/2800 |
| **DIMENSIONS AND WEIGHTS:** | | | |
| Dimensions of base | mm | 2240×910 | 88''×36'' |
| Overall dimensions of machine | mm | 2290×910×2860 | 90''×36''×112'' |
| Working space required | mm | 3960×3960×2260 | 155''×155''×89'' |
| Weight of machine with standard equipment | kg | 2550 | 5600 lbs |
| Weight of machine with packing | kg | 2690 | 5900 lbs |
| Weight of machine with seaworthy packing | kg | 3320 | 7300 lbs |
| Dimensions of seaworthy packing | m | 2.55×2.62× 1.17 | 100''×103''×46'' |
| Volume of seaworthy packing | m³ | 7,8 | 266 cu. ft. |

**STANDARD EQUIPMENT:** electrical equipment including electric motors, cooling equipment, 3 reducing sleeves Morse 4/3, 3/, 2/1, ejecting wedges, set of spanners, oil can, T-slot cleaner, screw driver, hooks for lifting including bolts, nuts, T-blocks and plugs, instruction book.

**EXTRA EQUIPMENT:**

2 change gears for lower range of spindle speeds 31 — 1400 r. p. m. style Ve 4, 2 change gears for increased range of spindle speeds 63—2800 r. p. m. style Ve 4, box table style Vb 4, universal table style Ve 4, vice style Vd 4.

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ČOK 53617 a — 5505

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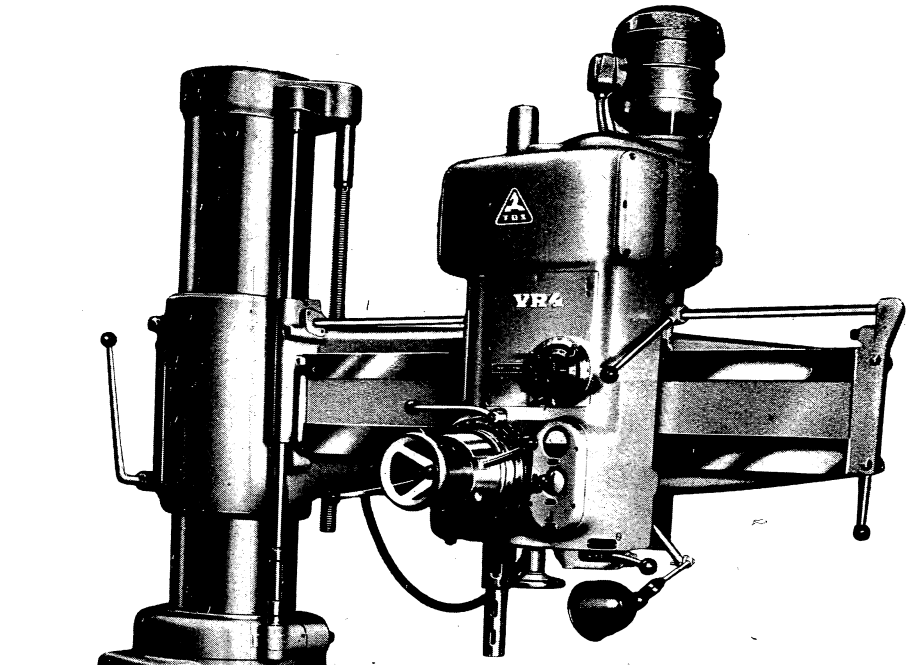
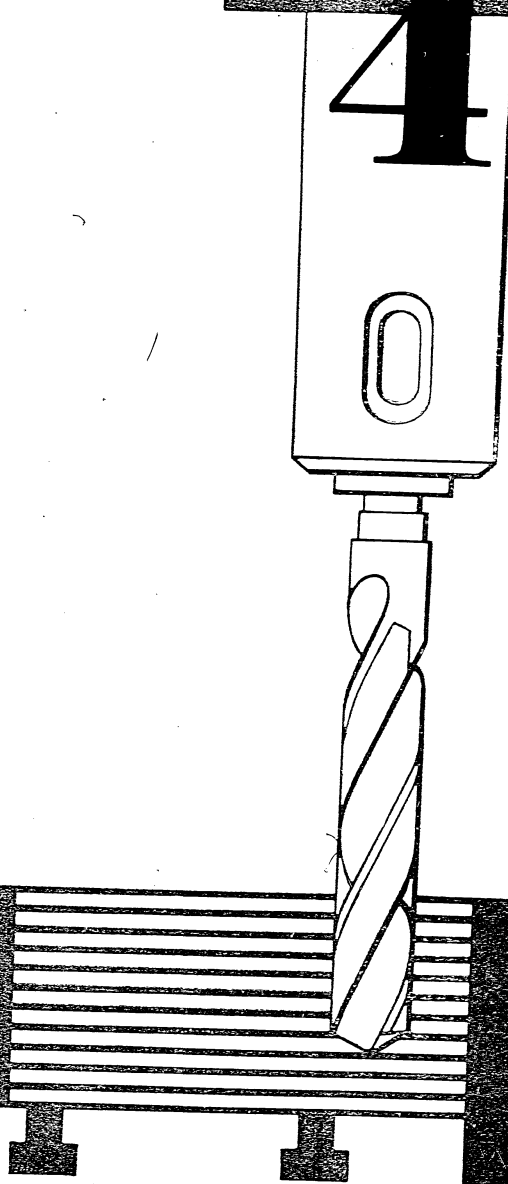
# RADIAL DRILLING MACHINE

*Model*

# VR 4 0



High output of the machine combined with lasting accuracy ■ Large working surface and wide range of distances between spindle and base allow big and relatively high pieces to be machined as well as very low ones (drilling of holes in metal sheets) ■ Rigidity of the machine within limits established by taking-over conditions in all working positions ■ Simplified and easy operation; small number of conveniently arranged controls centralised on spindle head ■ Patent guiding arrangement of sleeve by means of ball bearings running in hardened track on column ■ Patent positive locking of sleeve on column by means of locking nut ■ Sleeve locked on column and spindle head locked on arm by single lever ■ Control of drilling and elevating motors by single cross-type switch ■ Pre-selection and engagement of drilling spindle speeds and control of two-directional multi-plate clutch by single lever ■ Wide range of spindle speeds, 12 in number ■ Wide range of power feeds of the drilling spindle, 10 in number ■ 3 different ways of feeding the drilling spindle: coarse by hand, fine by hand, by power ■ Attachment for automatic release of the power feed when the required depth of drilling is reached ■ Automatic lubrication of the headstock unit by the circulation system.

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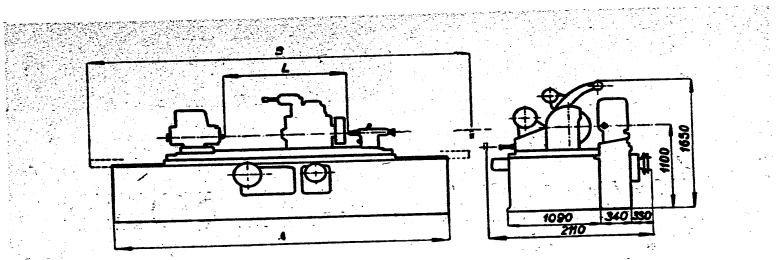


| | | | |
|---|---|---|---|
| L | 1000 | 1500 | 2000 |
| A | 3030 | 3930 | 4720 |
| B | 3400 | 4400 | 5650 |

Dimensional Drawing

## SPECIFICATION

| | | | | | | |
|---|---|---|---|---|---|---|
| Swing over bed | mm | 400 | | | 15 3/4" | |
| Distance between centers | mm | 1000 | 1500 | 2000 | 39 1 /32" | 59 7/16" 78 3/4" |
| Swing in open rest | mm | 120 | | | 4 23/32" | |
| **GRINDING WHEEL:** diameter × width | mm | 450 × 50 | | | 18" × 2" | |
| Maximum width of grinding wheel | mm | 100 | | | 4" | |
| Bore of grinding wheel, dia. | mm | 203 | | | 8" | |
| **WORKHEAD — TAILSTOCK:** | | | | | | |
| Taper of workhead and tailstock centers | | No. 4 Morse | | | | |
| Swivel of workhead | | 90° | | | | |
| Number of workspindle speeds | | 8 | | | | |
| Range of workspindle speeds | r. p. m. | 15 to 375 | | | | |
| Electric motor: speed r. p. m. — output kW | | 1400 | | | 0.8 | |
| **WHEELHEAD:** | | | | | | |
| Swivel of wheelhead (without workpiece) | | 60° | | | | |
| Transverse movement of wheelhead | mm | 190 | | | 7 1/2" | |
| Movement of wheelhead on slide | mm | 280 | | | 11" | |
| Power infeed during reversal of table (R. H. side, L. H. side, both sides), reduction of diameter | mm | 0.005 to 0.04 | | | 0.0002" to 0.0016" | |
| Power infeed during plunge cut grinding (independent of table), reduction of diameter, per minute | mm | 0.1 to 0.4 | | | 0 004" to 0.016" | |
| Grinding wheel speed | r. p. m. | 1285/1585 | | | | |
| Electric motor: speed r. p. m. — output kW | | 1425 | | | 5.5 | |
| **TABLE:** | | | | | | |
| Swivel of table | | 6° | 5° | 5° | 6° | 5° 5° |
| Maximum taper ground | | 1:5 | 1:6 | 1:6 | 1:5 | 1:6 1:6 |
| Maximum longitudinal travel of table | mm | 1185 | 1625 | 2150 | 46 21/32" | 64" 84 21/32" |
| Minimum travel of table (hydraulic) | mm | 1 | | | 0.04" | |
| Speed of table per minute, infinitely variable | metres | 0.1 to 6 | | | 4" to 19' 8" | |
| Electric motor of pump of hydraulic control: speed | r. p. m. | 1400 | | | | |
| output | kW | 1.85 | | | | |
| Electric motor of coolant pump: speed r. p. m. — output kW | | 2775 | | | 0.175 | |
| **INTERNAL GRINDING** (optional equipment): | | | | | | |
| Electric motor: speed r. p. m. — output kW | | 2800 | | | 1.6 | |
| **DIMENSIONS AND WEIGHTS:** | | | | | | |
| Floor space required by machine: width | mm | 2100 | | | 6' 1 " | |
| length | mm | 3400 | 4400 | 5650 | 11' 2" | 14' 5" 18' 6" |
| Weight of machine with standard equipment, net, approx. | kg | 5500 | 5800 | 6400 | 12130 | 12790 14110 lbs |
| Shipping weight of machine, seaworthy packing, approx. | kg | 6400 | 7000 | 7700 | 14110 | 15430 16980 lbs |
| Dimensions of packing case: length, approx. | mm | 3200 | 4200 | 5200 | 10' 6" | 13' 9" 17' 1" |
| width × height, approx. | mm | 2350 × 2000 | | | 7' 9" × 6' 7" | |

**Please state in your order the voltage available for the electric motors.**

**Changes reserved.**

**STROJEXPORT**

**PRAHA — CZECHOSLOVAKIA**

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**STROJEXPORT**

# TYPE 5U UNIVERSAL GRINDER

**A heavy duty precision machine** for cylindrical grinding, both longitudinal and plunge cut, and for face grinding **and internal grinding.**

**Hydraulic table feed.**

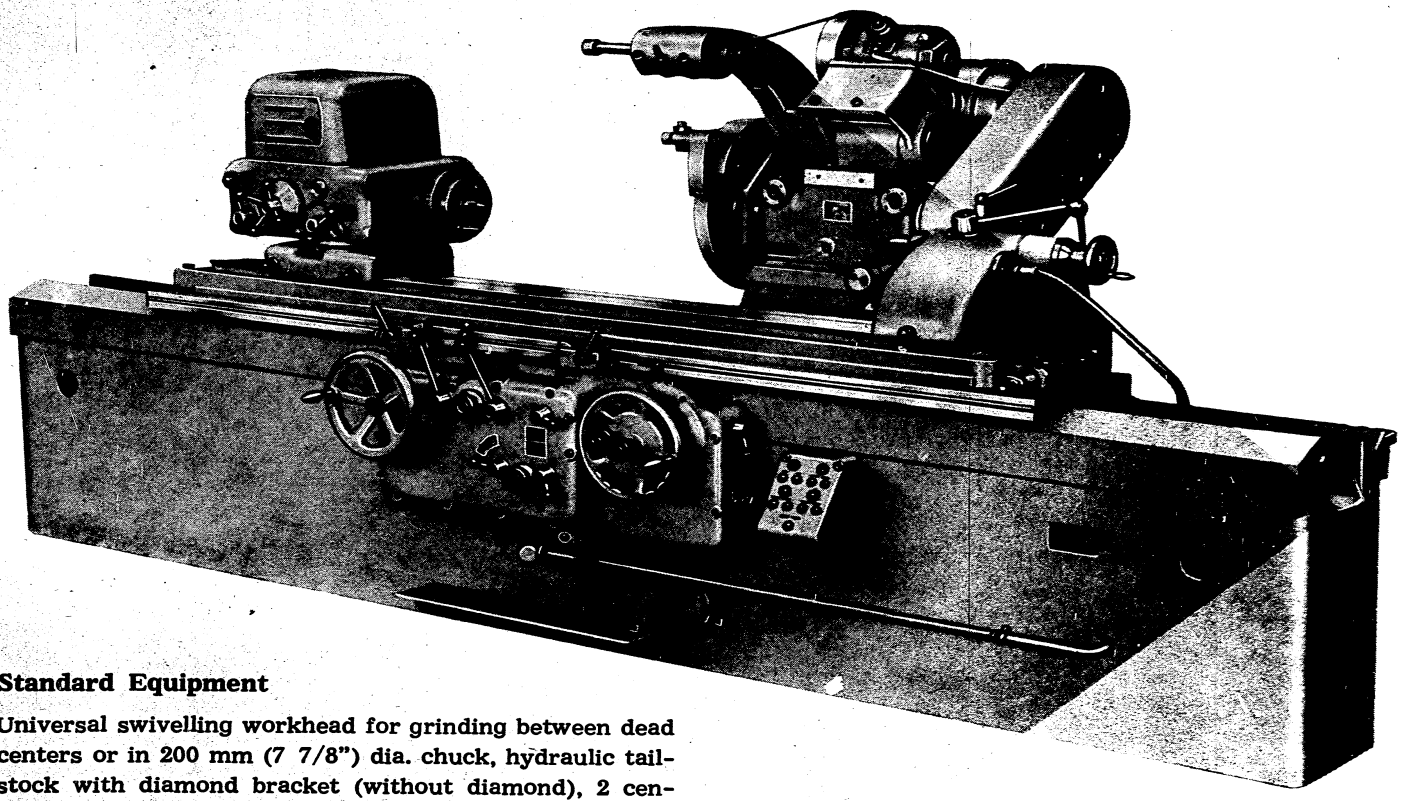
**Hydraulic feed of wheelhead.**

**Hydraulic rapid travel of wheelhead.**

**Swivelling wheelhead for grinding of tapers** by infeed method.

**Workhead with 8 spindle speeds and with 90° swivel** for face grinding.

**Two-speed hand feed of table.**



## Standard Equipment

**Universal swivelling workhead for grinding between dead centers or in 200 mm (7 7/8") dia. chuck, hydraulic tailstock with diamond bracket (without diamond), 2 centers, open rests (for 1000 mm, i. e. 39 11/32" between centers 1 unit, for 1500 mm, i. e. 59 7/16" between centers 2 units, for 2000 mm, i. e. 78 3/4" 3 units), set of drivers, wheelhead with wheelguard for 450×50 mm (18"×2") grinding wheel, grinding wheel 450×50 mm (18"×2") with balancing flange, grinding wheel flange puller, balancing arbor, extra belt pulley for worn grinding wheel, coolant pump with tank and piping, splash guards, electrical equipment with 4 electric motors for 380 Volts, 3 phase, 50 cycles with protective contactors and remote push-button control, set of spanners, operating instructions.**

## Optional Equipment

**Folding internal grinding** attachment, without spindle, **with electric** motor for 100 mm (3 15/16") dia. spindle **and reducing** sleeve for 70 mm (2 3/4") dia. spindle, **folding** diamond bracket (without diamond), closed rest **(maximum** dia. 105 mm, i. e. 4 1/8"), further spindles for internal grinding, balancing flange of grinding wheel, open rest, radius trueing attachment (without diamond), attachment for trueing grinding wheel according to template (without template or diamond), attachment for grinding steep tapers, balancing stand, collet chuck including 1 collet (range 5 to 16 mm, i. e. 13/64" to 5/8"), further collets, electromagnetic chuck 200 mm (7 7/8") dia. with demagneting switch, rectifier for electromagnetic chuck, lighting, electric motors and equipment for voltages other than 380 Volts, 50 cycles.

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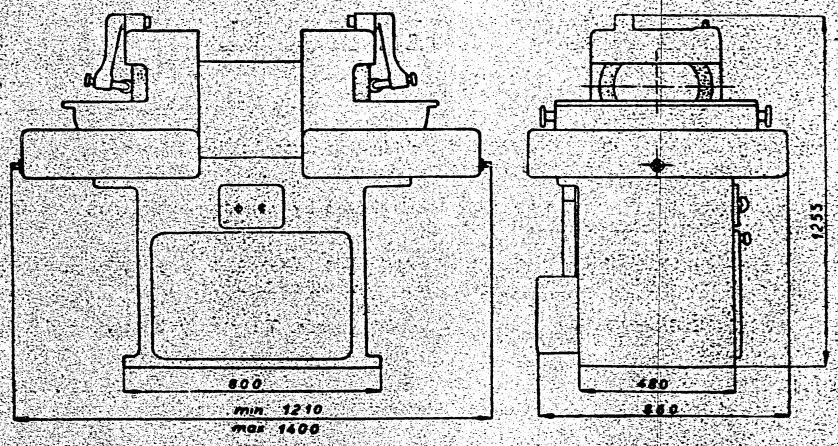
# SPECIFICATION

| | | Metric | English |
|---|---|---|---|
| Dimensions of grinding wheels: | | | |
| external diameter | mm | 350 | $13^3/_4$" |
| internal diameter | mm | 270 | $10^5/_8$" |
| width | mm | 100 or 70 | 4" or $2^3/_4$" |
| Speed of grinding wheel | R. p. m. | 1560 | 1560 |
| Dimensions of table | mm | 210×560 | $8^1/_4$"×22" |
| Table travel by hand | mm | 95 | $3^3/_4$" |
| Maximum angular setting of tilting tables | | ±20° | ±20° |
| Electric motor: Speed | R. p. m. | 1420 | 1420 |
| Output | HP | 2 | 2 |
| Floor space required | mm | 860×1420 | 34"×56" |
| Weight of machine: with standard equipment | kg | 820 | 1800 lbs. |
| with packing | kg | 840 | 1860 lbs. |
| with seaworthy packing | kg | 960 | 2120 lbs. |
| Contents boxed | $m^3$ | 2.25 | 80 cu. ft. |
| Size of case | cm | 100×150×150 | 39"×59"×59" |

As improvements in design are continually being made, this specification is not to be regarded as binding in detail and dimensions are subject to alteration without notice.

IN ORDERING, SPECIFY VOLTAGE, PHASE AND FREQUENCY OF POWER SUPPLY!

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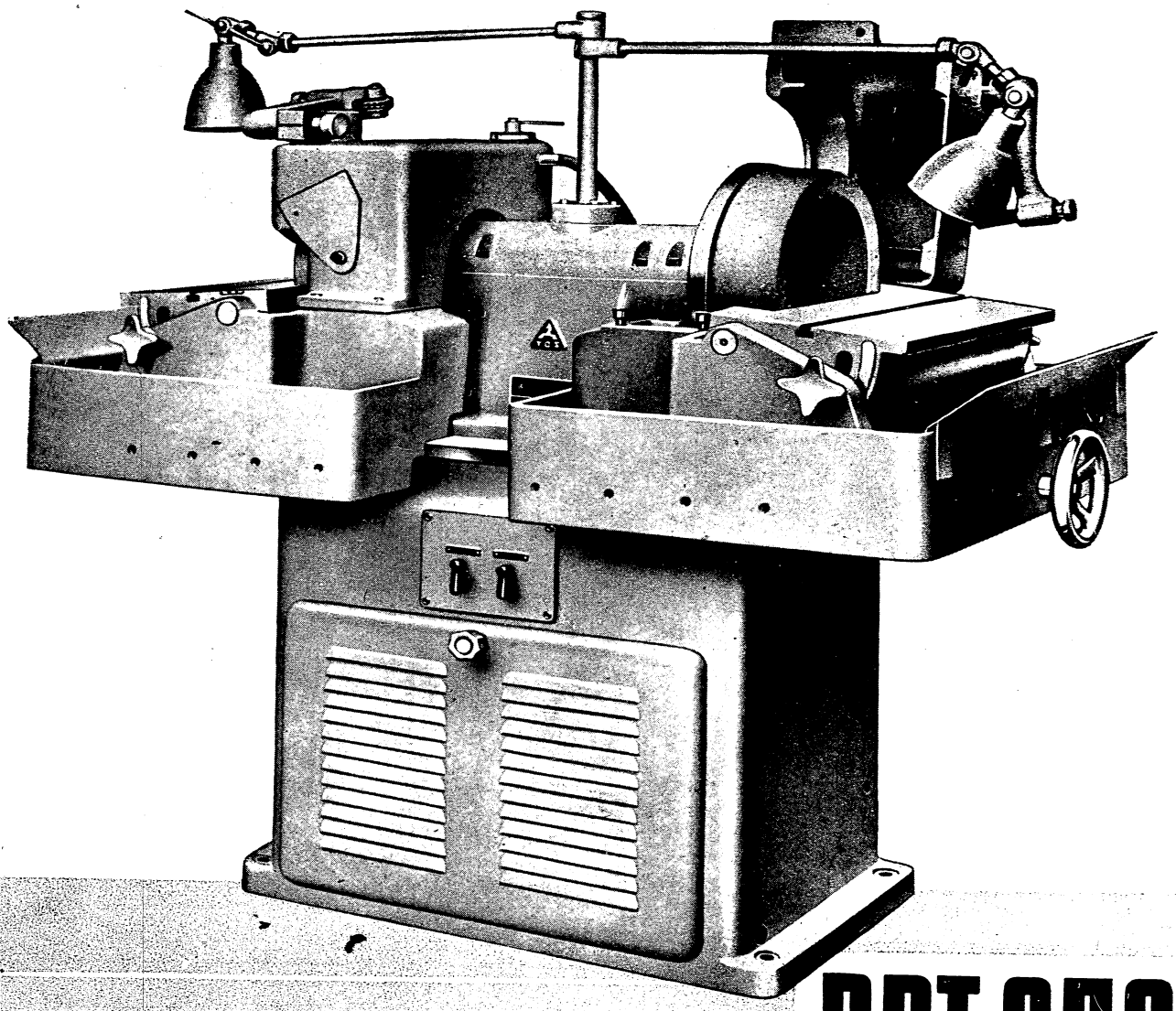

# DUPLEX-WHEEL TOOL GRINDER MODEL BBT 350

This machine is especially effective for the sharpening of carbide-tipped tools. The sharpening operation is performed by the face of the straight cup wheel while the tool rests on an angularly adjustable tilting table.

THE SPINDLE rotates in precision anti-friction bearings and is driven by two V-belts from the electric motor located inside the column which also contains the coolant tank.

THE TABLES may be angularly adjusted $\pm 20^{\circ}$ C and moved by a handwheel in the direction of the center line of spindle. Graduations in degrees indicate the angular setting of the work tables.

THE WHEEL TRUEING DEVICES are mounted on the wheel guards. They may be swung down and are finely adjustable by a screw.

STANDARD EQUIPMENT: electric motor with electrical equipment, 2 grinding wheels, 2 wheel trueing devices, 2 spare wheel flanges, coolant pump, operating instruction booklet.

TOS

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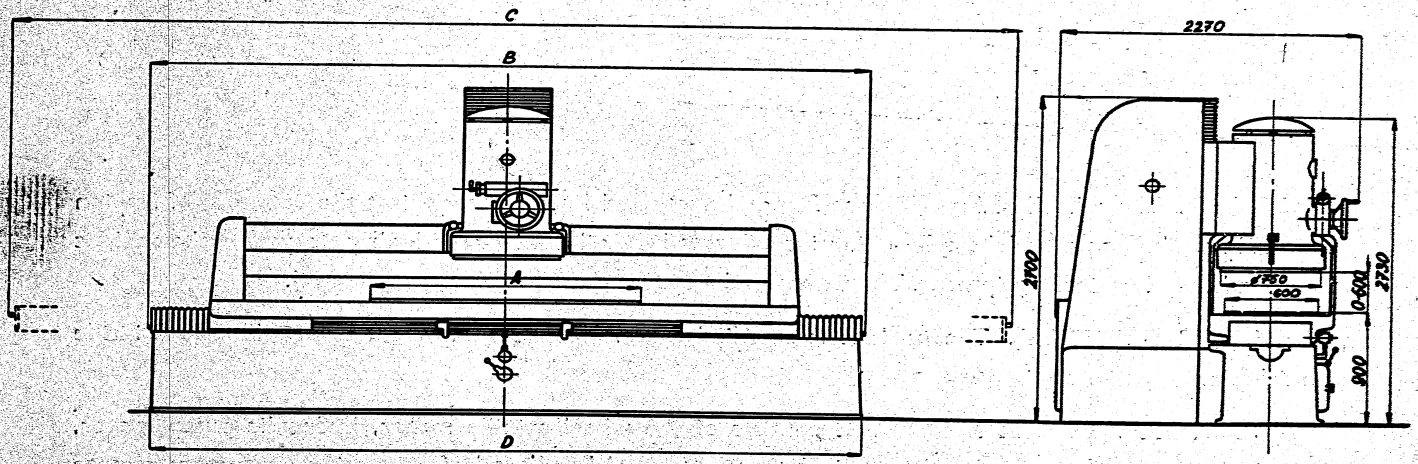
# SPECIFICATION BPV 700

BPV 700

| | | | | | |
|---|---|---|---|---|---|
| Working surface of table | mm | 600×1500 | 600×3000 | 23.6″×59″ | 23.6″×118″ |
| Maximum width ground | mm | 700 | 700 | 27.6″ | 27.6″ |
| Maximum distance, face of grinding wheel to table surface | mm | 600 | 600 | 23.6″ | 23.6″ |
| Outer diameter of grinding wheel | mm | 750 | 750 | 29.5″ | 29.5″ |
| Longitudinal travel of table | mm | 2420 | 3920 | 95″ | 154″ |
| Speed of longitudinal table travel (infinitely variable) | m/min. | 1—12 | 1—12 | 39.4″-472″ p. min. | 39.4″-472″ p. min. |
| Automatic vertical feed of wheelhead in table reversals, ranging from | mm | 0.004—0.1 | 0.004—0.1 | .00016″—.004″ | .00016″—.004″ |
| Speed of power vertical travel of wheel head | m/min. | 0.6 | 0.6 | 23.6″ p. min. | 23.6″ p. min. |
| Wheel spindle motor: | R. P. M. | 575 | 575 | 575 | 575 |
| | HP | 30 | 30 | 30 | 30 |
| Motor for vertical travel of wheelhead: | R. P. M. | 2800 | 2800 | 2800 | 2800 |
| | HP | 2.7 | 2.7 | 2.7 | 2.7 |
| Hydraulic pump motor: | R. P. M. | 1420 | 1420 | 1420 | 1420 |
| | HP | 5.5 | 5.5 | 5.5 | 5.5 |
| Floor space required | mm | 2275×6850 | 2275×10.020 | 90″×270″ | 90″×393″ |
| Weight of machine: with standard equipment | kg | 11,000 | 13,000 | 24,300 lbs. | 28,800 lbs. |
| with packing | kg | 11,900 | 14,200 | 26,300 lbs. | 31,300 lbs. |
| with seaworthy packing | kg | 12,200 | 14,800 | 27,000 lbs. | 32,700 lbs. |




| Type | A | B | C | D |
|---|---|---|---|---|
| BPV 700×1500 | 1500 | 4700 | 6850 | 4550 |
| BPV 700×3000 | 3000 | 6550 | 10020 | 6400 |

**As improvements in design are continually being made, this specification is not to be regarded as binding in detail, and dimensions are subject to alteration without notice.**

**IN ORDERING, SPECIFY VOLTAGE, PHASE AND FREQUENCY OF POWER SUPPLY!**

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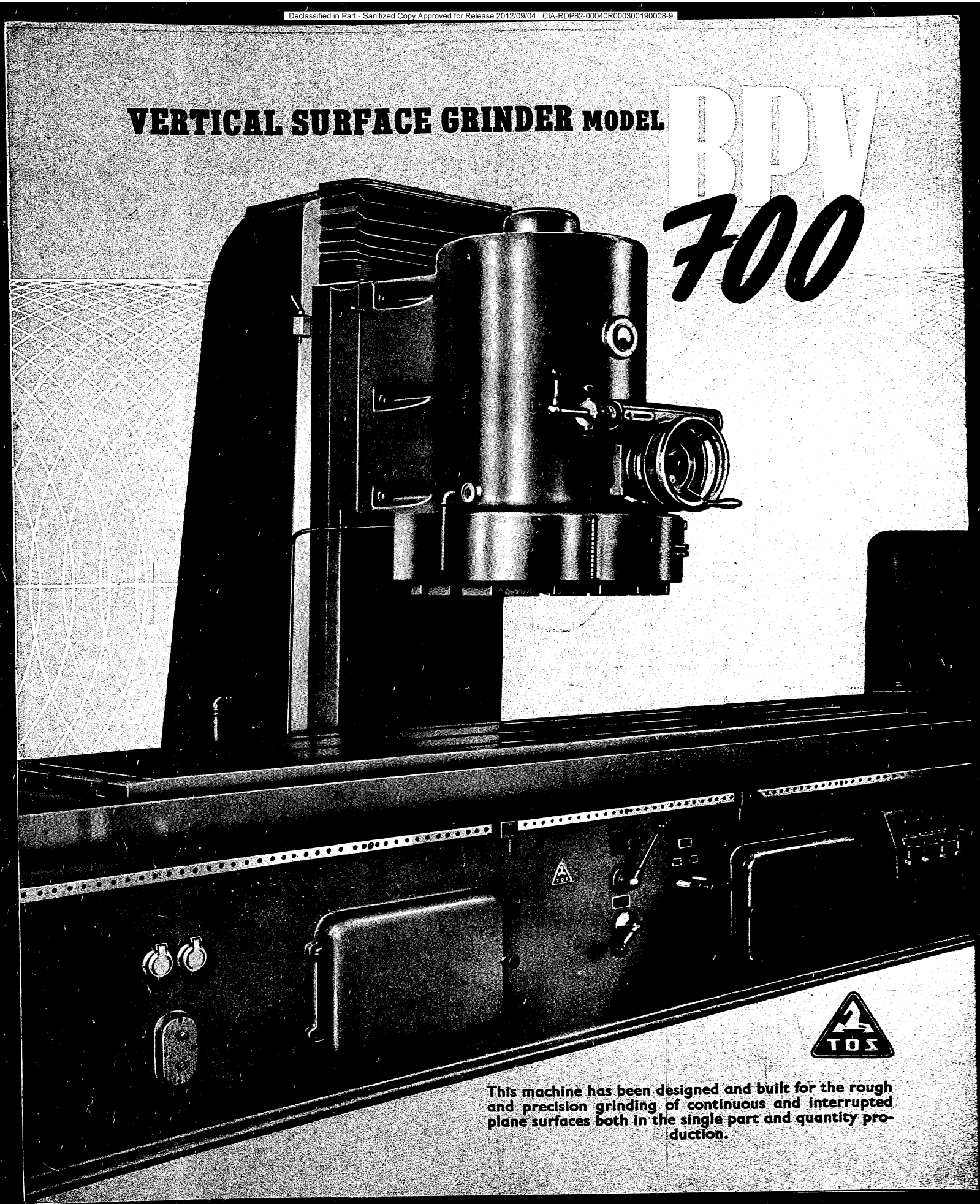
# VERTICAL SURFACE GRINDER MODEL BPV 700



TOS

This machine has been designed and built for the rough and precision grinding of continuous and interrupted plane surfaces both in the single part and quantity production.

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## SPECIFICATIONS

| MODEL | | STATIONARY BED MACHINES | | | | | | | ADJUSTABLE BED MACHINES | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | HIGH-SPEED PRESSES | | SLOW-SPEED PRESSES | | | | | HIGH-SPEED PRESSES | | SLOW-SPEED PRESSES | |
| | | LS 20/180 | LS 50/280 | LP 20/180 | LP 50/280 | LP 100/320 | LP 125/355 | LP 250/420 | LSp 20/185 | LSp 50/265 | LPp 20/185 | LPp 50/265 |
| Cutting pressure | lb | 44 000 | 110 000 | 44 000 | 110 000 | 220 000 | 275 000 | 550 000 | 44 000 | 110 000 | 44 000 | 110 000 |
| | kg | 20 000 | 50 000 | 20 000 | 50 000 | 100 000 | 125 000 | 250 000 | 20 000 | 50 000 | 20 000 | 50 000 |
| Throat | in. | 7.2 | 11.2 | 7.2 | 11.2 | 12.8 | 14.2 | 16.8 | 7.4 | 10.6 | 7.4 | 10.6 |
| | mm | 180 | 280 | 180 | 280 | 320 | 355 | 420 | 185 | 265 | 185 | 265 |
| Area sheared (Ks = 25 t per sq. in.) | in. | 20 | 50 | 20 | 50 | 100 | 125 | 250 | 20 | 50 | 20 | 50 |
| | mm | 500 | 1 250 | 500 | 1 250 | 2 500 | 3 125 | 6 250 | 500 | 1 250 | 500 | 1 250 |
| Plate thickness | in. | 0.16 | 0.22 | 0.2 | 0.36 | 0.48 | 0.52 | 0.64 | 0.16 | 0.2 | 0.2 | 0.36 |
| | mm | 4 | 5,5 | 5 | 9 | 12 | 13 | 16 | 4 | 5 | 5 | 9 |
| Distance, table to ram* | in. | 10 | 12.6 | 10 | 12.6 | 14.4 | 16 | 20 8 | | | | |
| | mm | 250 | 315 | 250 | 315 | 360 | 400 | 520 | | | | |
| Adjustment of stroke | in. | 0.4-2.4 | 0.4-3.2 | 0.4-2.4 | 0.4-3.2 | 0.4-3.6 | 0.8-4 | 1.2-5.2 | 0.4-2.4 | 0.4-3.2 | 0.4-2.4 | 0.4-3 2 |
| | mm | 10-60 | 10-80 | 10-60 | 10-80 | 10-90 | 20-100 | 30-130 | 10 60 | 10-80 | 10-60 | 10-80 |
| Adjustment of ram | in. | 1.6 | 2 | 1.6 | 2 | 2.4 | 2.8 | 2.8 | 1.6 | 2 | 1.6 | 2 |
| | mm | 40 | 50 | 40 | 50 | 60 | 70 | 70 | 40 | 50 | 40 | 50 |
| Dimensions of table | in. | 16x13.4 | 22.4x19 | 16x13.4 | 22.4x19 | 28x22.4 | 30x24 | 42x34 | 16.8x13.6 | 24x19.2 | 16.8x13.6 | 24x19.2 |
| | mm | 400x335 | 560x475 | 400x335 | 560x475 | 700x560 | 750x600 | 1050-850 | 420x340 | 600x480 | 420x340 | 600x480 |
| Diameter of drop-hole in table | in. | 4.8 | 9.6 | 4.8 | 9.6 | 11.2 | 12 | 20 | 4.8 | 9.6 | 4.8 | 9.6 |
| | mm | 120 | 240 | 120 | 240 | 280 | 300 | 500 | 120 | 240 | 120 | 240 |
| Pin hole in ram (diameter x depth) | in. | 1.28x2.4 | 1.6x3 | 1.28x2.4 | 1.6x3 | 2x3.4 | 2x3.4 | 2.4x5 | 1.28x2.4 | 1.6x3 | 1.28x2.4 | 1.6x3 |
| | mm | 32x60 | 40x75 | 32x60 | 40x75 | 50x85 | 50x85 | 60x125 | 32x60 | 40x75 | 32x60 | 40x75 |
| Bolster plate (thick) | in. | 2.2 | 2.8 | 2.2 | 2.8 | 3.4 | 3.6 | 4.4 | 2.2 | 2.8 | 2.2 | 2.8 |
| | mm | 55 | 70 | 55 | 70 | 85 | 90 | 110 | 55 | 70 | 55 | 70 |
| Flywheel (diameter x width) | in. | 3.2 | 6.4 | 3.2 | 6.4 | 8 | 9 | 12.8 | 3.2 | 6.4 | 3.2 | 6.4 |
| | mm | 80 | 160 | 80 | 160 | 200 | 225 | 320 | 80 | 160 | 80 | 160 |
| Speed of flywheel | R. p. M. | 800x100 | 1160x112 | | | | | | 800x100 | 1 160x112 | | |
| Number of strokes per min. | | 125 | 110 | 360 | 360 | 300 | 300 | 250 | 125 | 110 | 360 | 360 |
| | | 125 | 110 | 60 | 60 | 50 | 50 | 35 | 125 | 110 | 60 | 60 |
| Power required for driving moto-** | kW | 1.5 | 3.7 | 1,5 | 3 | 6 | 5.5 | 15 | 1.5 | 3.7 | 1.5 | 3 |
| Speed of moto- | R. p. M. | 940 | 940 | 1 420 | 1 420 | 1 450 | 1420 | 1 420 | 940 | 940 | 1 420 | 1420 |
| Maximum distance, table to ram | in. | | | | | | | | 14 | 17.2 | 14 | 17.2 |
| | mm | | | | | | | | 350 | 430 | 350 | 430 |
| Minimum distance, table to ram | in. | | | | | | | | 7.2 | 10 | 7.6 | 10 |
| | m | | | | | | | | 180 | 250 | 190 | 250 |
| Diameter of hole in frame (for steel horn) | in. | | | | | | | | 6 | 7.6 | 6 | 7.6 |
| | mm | | | | | | | | 150/7,5⁵ | 190/7,5⁵ | 150/7,5⁵ | 190/7,5⁵ |
| Maximum distance, centre-line of horn to ram | in. | | | | | | | | 10 | 14 | 10 | 14 |
| | mm | | | | | | | | 250 | 350 | 250 | 350 |
| Weight of machine about | lb. | 2 354 | 5 170 | 2 464 | 5 368 | 10 450 | 12 210 | 30 316 | 2 761 | 7 763 | 3 036 | 8 074 |
| | kg | 1 070 | 2 350 | 1 120 | 2 440 | 4 750 | 5 550 | 13 780 | 1 255 | 3 530 | 1 380 | 3 670 |
| Weight, packed for rail abou: | lb. | 2 503 | 5 522 | 2 618 | 5 720 | 10 890 | 12 672 | | | | | |
| | kg | 1 140 | 2 510 | 1 190 | 2 600 | 4 950 | 5 760 | | | | | |
| Weight, packed for sea abou: | lb. | 2 860 | 5 973 | 2 970 | 6 171 | 11 550 | 14 670 | | | | | |
| | kg | 1 300 | 2 715 | 1 350 | 2 805 | 5 250 | 6 670 | | | | | |
| Dimensions boxed | | | 6'9"x4'4" x3'2" | 7'7"x3'10" x4 4" | 6'8"x4'2" x3'2" | 7'7"x5'3" x3'10" | | | | | | |
| | cm | | 203x121 x 96 | 227x115 x130 | 200x125 x 96 | 227x157 x115 | | | | | | |
| Contents boxed | cu. ft. | | 83.36 | 120.09 | 81.77 | 144.81 | | | | | | |
| | mm | | 2,36 | 3,4 | 2,4 | 4,1 | | | | | | |

* Measured without bolster plate. — ** When applying the automatic strip-feed device the power required is increased accordingly.

**WHEN ORDERING, SPECIFY VOLTAGE, PHASE AND FREQUENCY OF POWER SUPPLY**

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**STROJEXPORT** PRAHA — CZECHOSLOVAKIA

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## AUTOMATIC STRIP-FEED ATTACHMENTS

| Model | Width of strip up to in. (mm) | Thickness of strip up to in. (mm) | Feed ranging from — to in. (mm) | Height of strip above table in. (mm) |
|---|---|---|---|---|
| VP$_2$–I | 4 (100) | 0.06 (1.5) | 0–4 (0–100) | 2.4 (60) |
| VP$_2$–II | 8 (200) | 0.06 (1.5) | 0–6 (0–150) | 3.2 (80) |
| KP–21 | 4.4 (110) | 0.03 (2) | 0–4 (0–100) | 2.4 (60) |
| KP–22 | 8.4 (210) | 0.03 (2) | 0–6.8 (0–170) | 3.2 (80) |
| SVP–I | 4 (100) | 0.08 (2) | 0–6 (0–150) | 2.6 (65) |
| SVP–IV | 8 (200) | 0.08 (2) | 0–10 (0–250) | 2.8 (70) |

## STRIP-STRAIGHTENING DEVICES

| Model | Supplied with strip-feed attachment only | Number of rolls | Width of strip in in. (mm) | Max. thickness of strip in in. (mm) |
|---|---|---|---|---|
| VA–5 | KP–21 SVP–II | 5 | 4.4 (110) | 0.012 (0.3) |
| VA–7 | KP–22 SVP–V | 7 | 8.4 (210) | 0.02 (0.5) |

For quantity production from coiled strips the machines are equipped with a two-side gripper-feed or roll-feed attachment, or with a one-side double roll feed attachment. These attachments are supplied in two sizes for 20 ton and 50 ton machines.

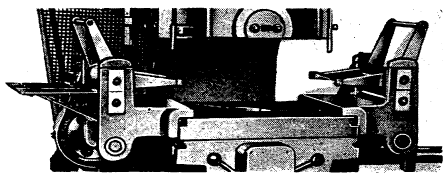
On special order one-side roll-feed and gripper-feed attachments as well as roll-feed attachments with adjustable height of strip above the bolster plate and attachments for larger presses can be supplied.

The double roll-feed and gripper-feed attachments are recommended to be employed in conjunction with strip straightening rolls to remove kinks, etc. from the coils. The straightening rolls are available with 5 or 7 rolls and can be used for thinner plates only:

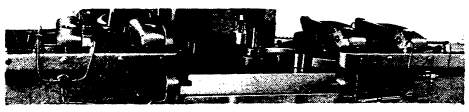
VA 5 for devices KP-21 and SVP-II up to a maximum plate thickness of 0.012 in.

VA 7 for devices KP-22 and SVP-IV up to a maximum plate thickness of 0.02 in.

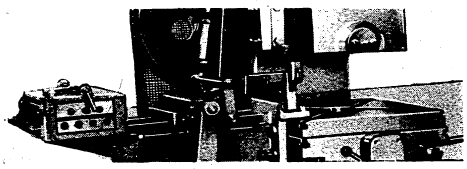
Automatic strip-feed attachments can easily be put out of action and the press used for single stroke operation.



Two-side Single Roll Feed Attachment.

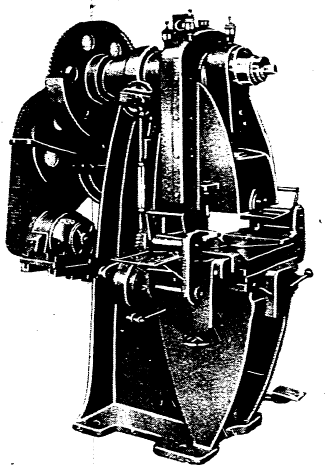


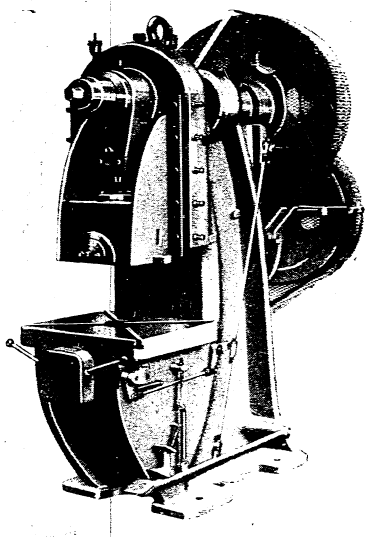
Two-side Gripper Feed Attachment.



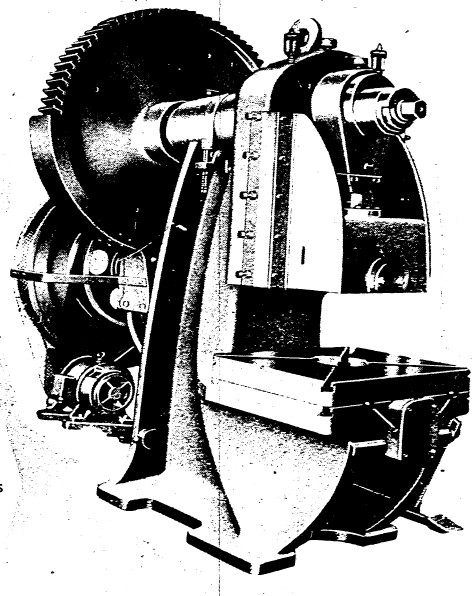
Double Roll Feed Attachment.

LP-20 with Adjustable Two-side Single Roll Feed attachment.





Gap-Frame Press Type LP 50.



Gap-Frame Press Type LP 125.

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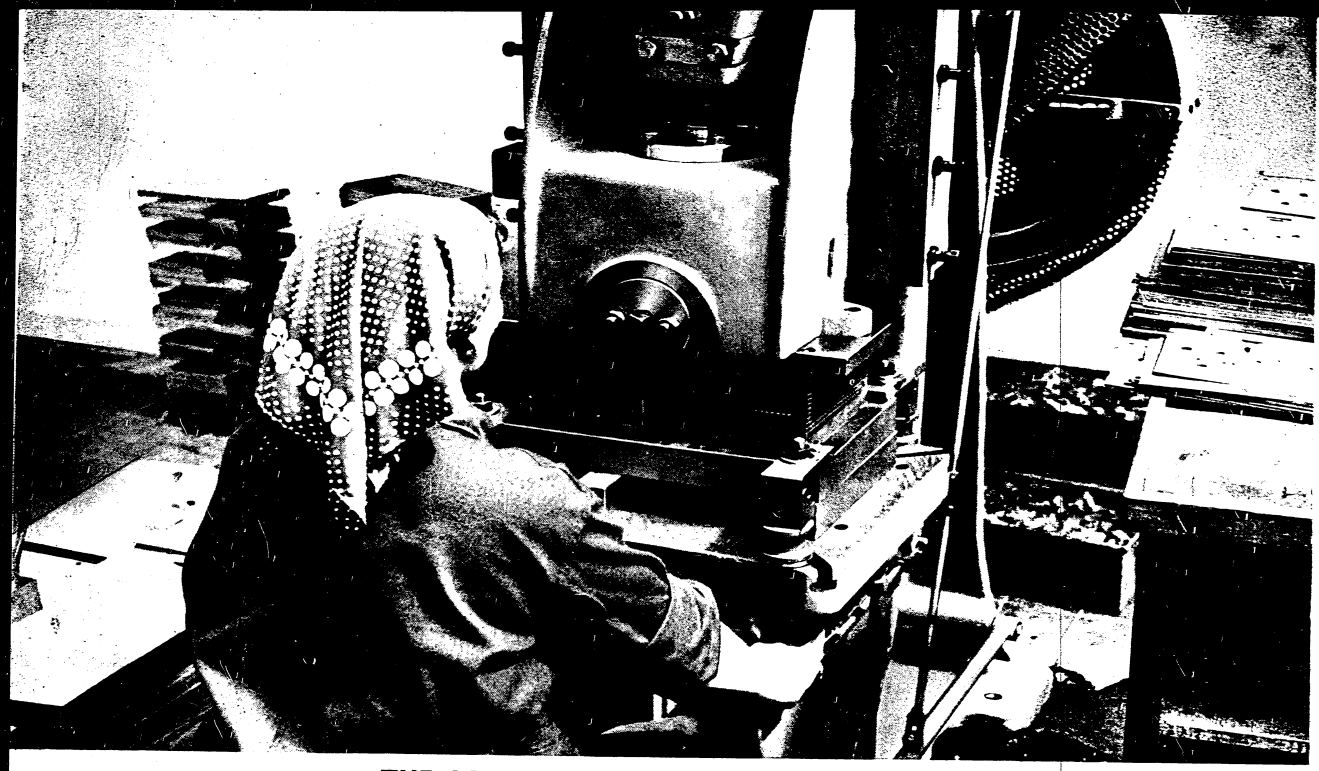

## THE GAP - FRAME ECCENTRIC PRESSES

of 44.000 to 550.000 lb. cutting pressure are supplied in four sizes:

LS High-speed Eccentric Presses,
LP Slow-speed Eccentric Presses with Geared Countershaft
LSp High-speed Presses with Adjustable Bed,
LPp Slow-speed Presses with Adjustable Bed.

The machines have an extremely rigid frame to ensure full utilization of their capacity and accuracy of products to close limits according to the generally valid conditions. The high and permanent accuracy of our machines has been attained by ingenious design, carefully selected materials and high-grade workmanship of all machine parts.
All ratings in the data sheet are based on the shearing strength of the material to be cut k=25 T per sq. in. The areas sheared given in the data sheet refer only to tools with a straight edge. The nominal capacity of the machine is obtained with the position of the crankshaft 30 deg. above the bottom dead point.

If the machine starts to operate before reaching this position as, for instance, in drawing, the cutting pressure should be reduced to prevent the torque from being exceeded.
The area sheared F and the cutting pressure P can be determined from the formulae:

$$F = O \times s,$$
$$P = F \times k,$$

where "O" is the circumference of the hole to be punched in mm, "s" the plate thickness in mm and "k" the shearing strength of the material in kg per sq. mm. All cutting pressures and stock thicknesses stated in the data sheet are maximum values which should not be exceeded. When cutting thin plates the punch should be properly adapted by bevelling its cutting edge to facilitate the shearing operation which, if performed with a straight punch, would require a pressure higher than the machine is capable to withstand. Nor should the allowable work, which is equal to the product of the maximum cutting pressure and of the maximum plate thickness given in the data sheet, be exceeded.
**Example:** A hole of 1.28 in. in diameter is to be punched in a plate 0.2 in. thick and 25 T per sq. in. tensile. The size of the press to be employed is determined from the area sheared $F = 1.28 \times \pi \times 0.2 = 0.775$ sq. in. Thus the cutting pressure $P = 0.775 \times 25 = 19.375$ Tons. With respect to the plate thickness the suitable machine will be the Type LP 20 with a cutting pressure of 19 Tons 840 lb.
As the data sheet refers to shearing operations only, the depth of draw — when using the machine for drawing — should not exceed 45 per cent of the machine stroke. Otherwise the press would not prove sufficient in several respects: the motor would be too weak, the fly-wheel too light and the belt would slip.

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# GAP-FRAME ECCENTRIC PRESSES

The machines which are described in the catalogue, are especially well-suited for heavy shearing and punching operations as well as for light profiDeclassified in Part - Sanitized Copy Approved for Release 2012/09/04 : CIA-RDP82-00040R000300190008-9 design, high effi

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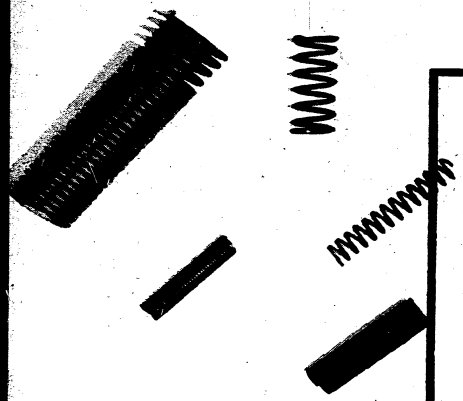
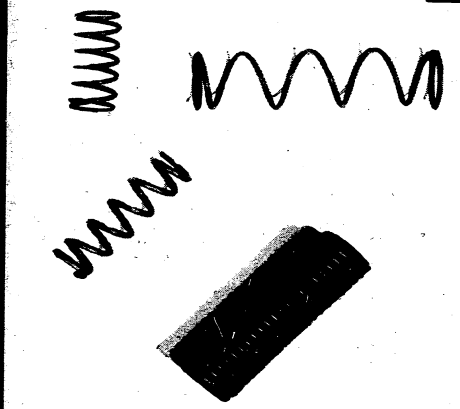


## NORMALZUBEHÖR

1 Satz Einzugräder, 1 Satz Drahtführungen, 1 Satz Führungsgabeln, 3 Hackmesser, 3 Hackdorne, 3 schmale Steigungskeile für rechtsgängige Federn, schmale Steigungskeile für linksgängige Federn, 3 breite Steigungskeile für rechtsgängige Federn, 3 breite Steigungskeile für linksgängige Federn, 1 Satz Steigungskurvenscheiben, 1 Satz Längskurvenscheiben, 3 vorgedrehte Ringe für Herstellung von Kurvenscheiben für Formfedern, 1 Aufwindevorrichtung für rechtsgängige Federn, 1 Aufwickelvorrichtung für linksgängige Federn, 1 Drahtständer, Bedienungsschlüssel, Ölkanne, Stückzähler, komplette elektrische Ausrüstung.

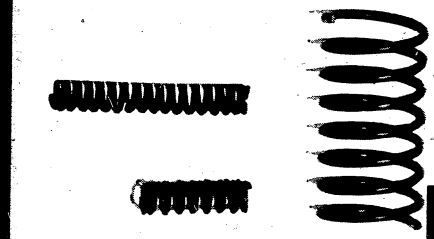
Einrichtung für Herstellung von Ringen - Höchstleistung 180 Stück je Minute.

Kühlmittelbehälter samt Pumpe und Rohrleitung.

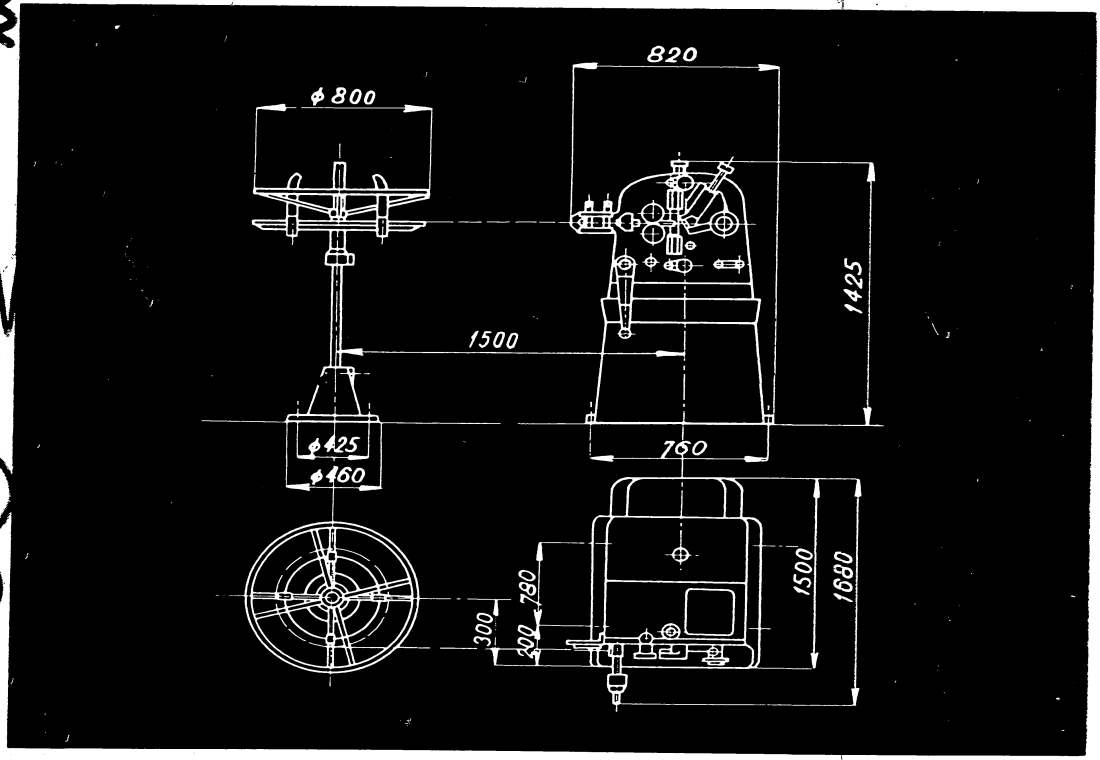


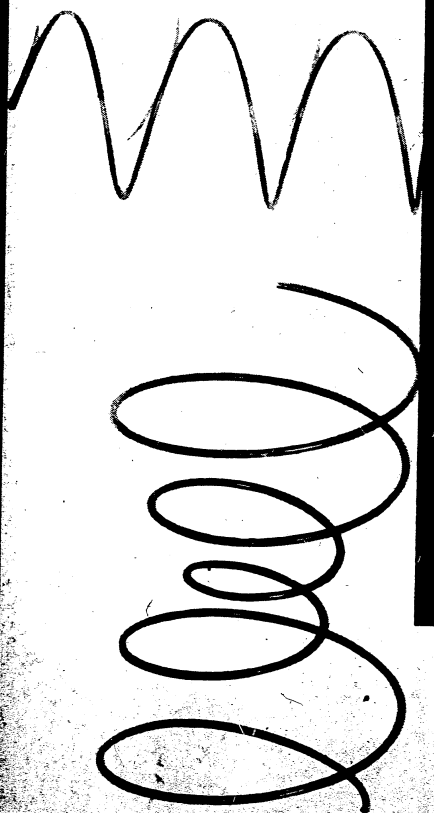
## TECHNISCHE ANGABEN

| | | |
|---|---|---|
| Kleinster Drahtdurchmesser | mm | 0.8 |
| Größter Drahtdurchmesser | mm | 3.5 |
| Größter Federdurchmesser | mm | 50 |
| Kleinster Federdurchmesser | mm | 6 |
| Größtmögliche aufgewickelte Federlänge mit selbsttätigem Abhacken | mm | 11000 |
| Höchstleistung bei der Spiralenherstellung | Stück/min | 75 |
| Höchstleistung bei der Herstellung von Ringen | Stück/min | 180 |
| Elektromotor: Drehzahl | U/min | 1400 |
| Leistung | PS | 3 |
| Durchmesser der Drahtspule | mm | 800 |
| Tragfähigkeit des Drahtständers | kg | 100 |
| Gewicht der Maschine mit Zubehör | kg | 1050 |
| Gewicht der Maschine mit Verpackung | kg | 1200 |
| Kistenmaße | cm | 270 × 90 × 150 |



## MAßSKIZZE



**STROJEXPORT**

PRAHA - TSCHECHOSLOWAKEI

ČOK 52535n - 5501

Gedruckt in der Tschechoslowakei

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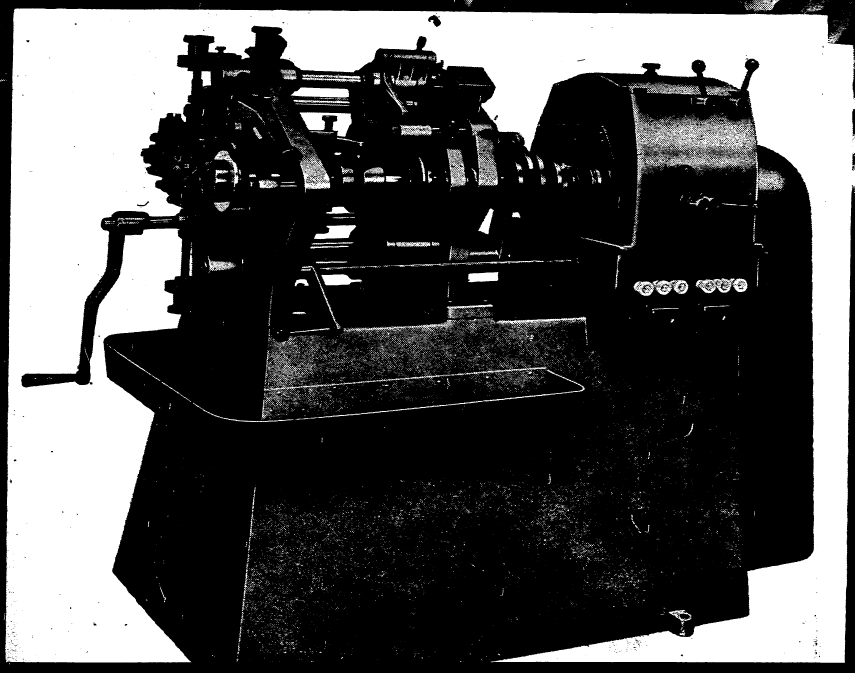
TOS

# Universal-Spiralfederautomat



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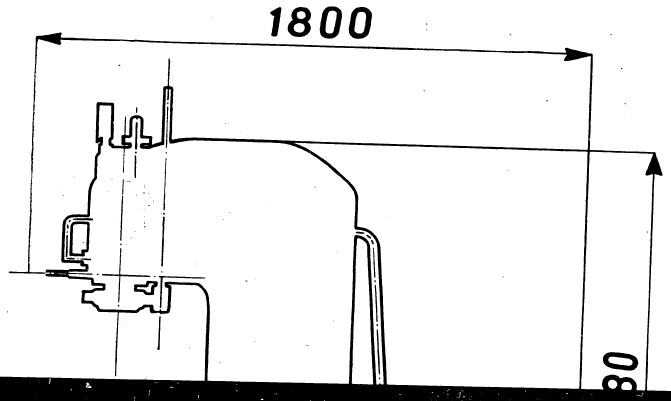
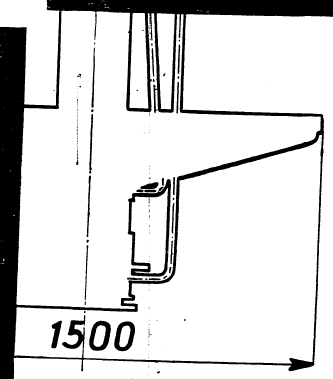
## SPECIFICATIONS:

| | | |
|---|---|---|
| Maximum pressure | tons | |
| Return pressure | tons | |
| Maximum distance between platens | mm | |
| Maximum stroke of piston | mm | |
| Diameter of piston | mm | 125/ |
| Throat | mm | |
| Dimensions of table | mm | 1500× |
| Drop-hole in table | mm | ∅ |
| Piston speed for down stroke by low pressure | mm/sec | |
| Piston speed for down stroke by high pressure | mm/sec | |
| Return speed of piston | mm/sec | |
| Capacity of power unit RPZ 2: | | |
| Gear pump supplies 45 litres (10 galls) per minute up to | at | |
| Plunger pump supplies 2.7 litres (0.6 galls) per minute up to | at | |
| Output of motor | kW | |
| Dimensions of machine (length × width × height) | cm | 180×15 |
| Dimensions of seaworthy packing (length × width × height) | cm | 190×9 |
| Net weight of machine | kg | 1 |
| Weight of machine with packing | kg | 1 |
| Weight of machine with seaworthy packing | kg | 1 |

IN ORDERING, SPECIFY VOLTAGE, PHASE AND FREQUENCY OF

As improvements in design are continually being made, this specification is no
in detail, and dimensions are subject to alteration withou




ZECHOSLOVAKIA

Svoboda 4

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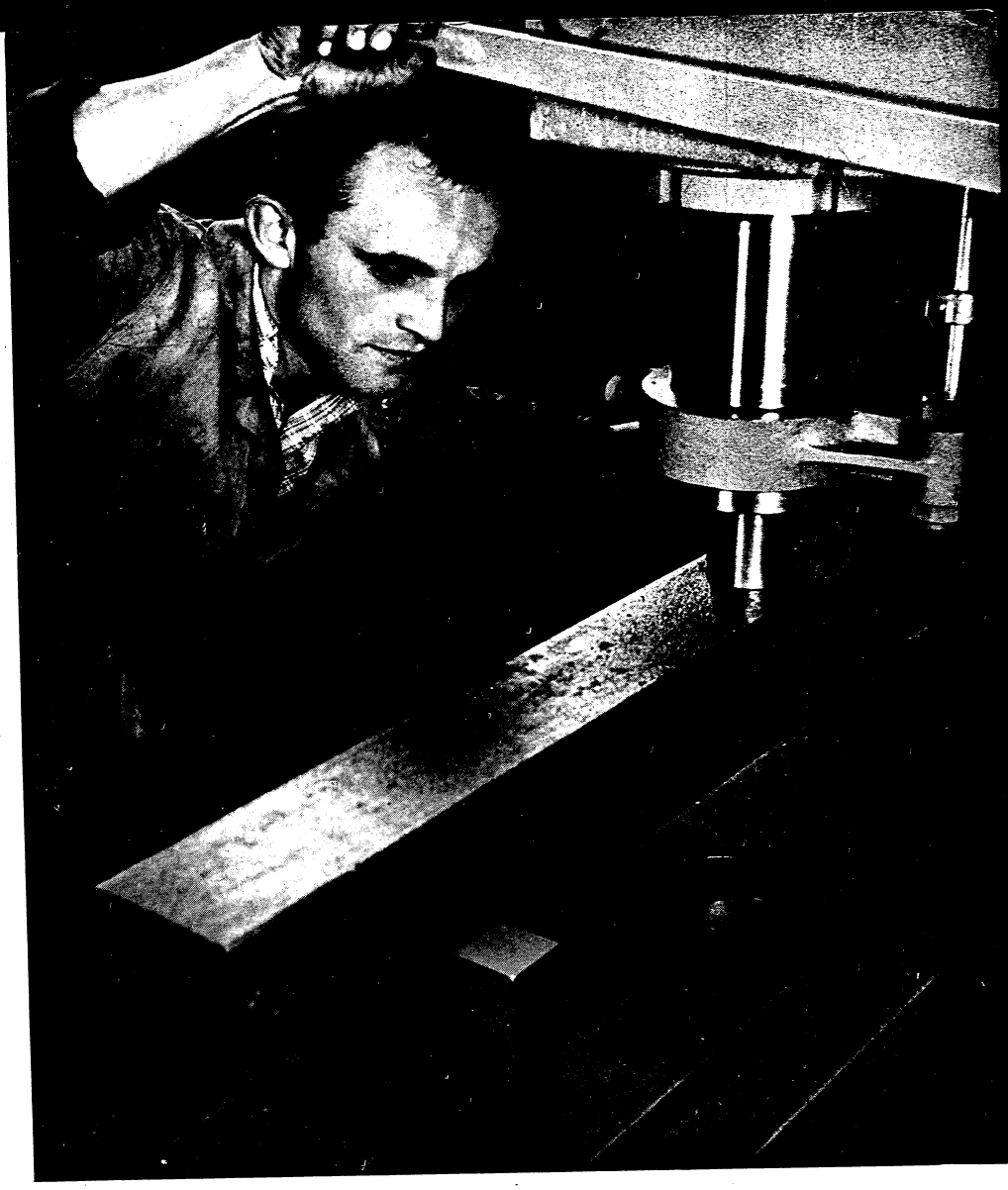
TOS



# LD 30

## HYDRAULIC STRAIGHTENING PRESS MODEL LD 30

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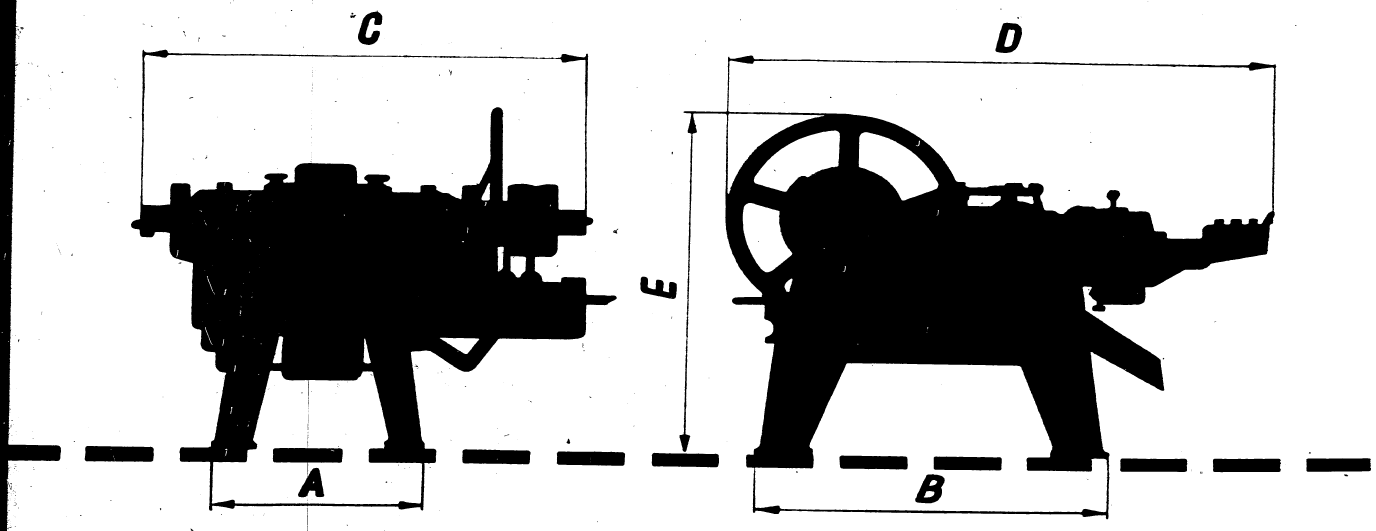
## SPECIFICATIONS:

| Model | LHA 50 | LHA 70 | LHA 110 |
|---|---|---|---|
| Number of nails per minute approx. . . . | 500 | 400 | 350 |
| Capacity: Diameter of wire approx. . . . . mm | 1—2.2 | 1.8—3.1 | 2.2—3.8 |
| Length of nail approx. . . . . mm | 10—50 | 15—70 | 13—110 |
| Required belt drive . . . . . HP | 1 | 3 | 4 |
| Speed of pulley . . . . . r. p. m. | 500 | 400 | 350 |
| Net weight approx. . . . . kg | 450 | 800 | 1400 |
| Overall dimensions approx. . . . . mm | 1035×1070×1210 | 1100×1400×1600 | 1160×1620×2120 |
| Size of box approx. . . . . mm | 1230×1270×1220 | 1300×1600×1600 | 1400×1900×2200 |

IN ORDERING, SPECIFY VOLTAGE, PHASE AND FREQUENCY OF POWER SUPPLY.

With a view to the continuous improvement of our products the technical data and illustrations do not always comply with the latest design so that they are not binding in details and weights.

| | A | B | C | D | E |
|---|---|---|---|---|---|
| LHA 50 | 340<br>13.3″ | 640<br>25.2″ | 1070<br>42.2″ | 1210<br>47.8″ | 1035<br>40.8″ |
| LHA 70 | 440<br>17.3″ | 850<br>33.4″ | 1380<br>54.3″ | 1560<br>61.5″ | 1085<br>42.8″ |
| LHA 110 | 700<br>27.4″ | 1220<br>48″ | 1620<br>63.6″ | 2120<br>83.2″ | 1160<br>45.6″ |




# STROJEXPORT - PRAHA - CZECHOSLOVAKIA

ČOK - 53723 a - 5504

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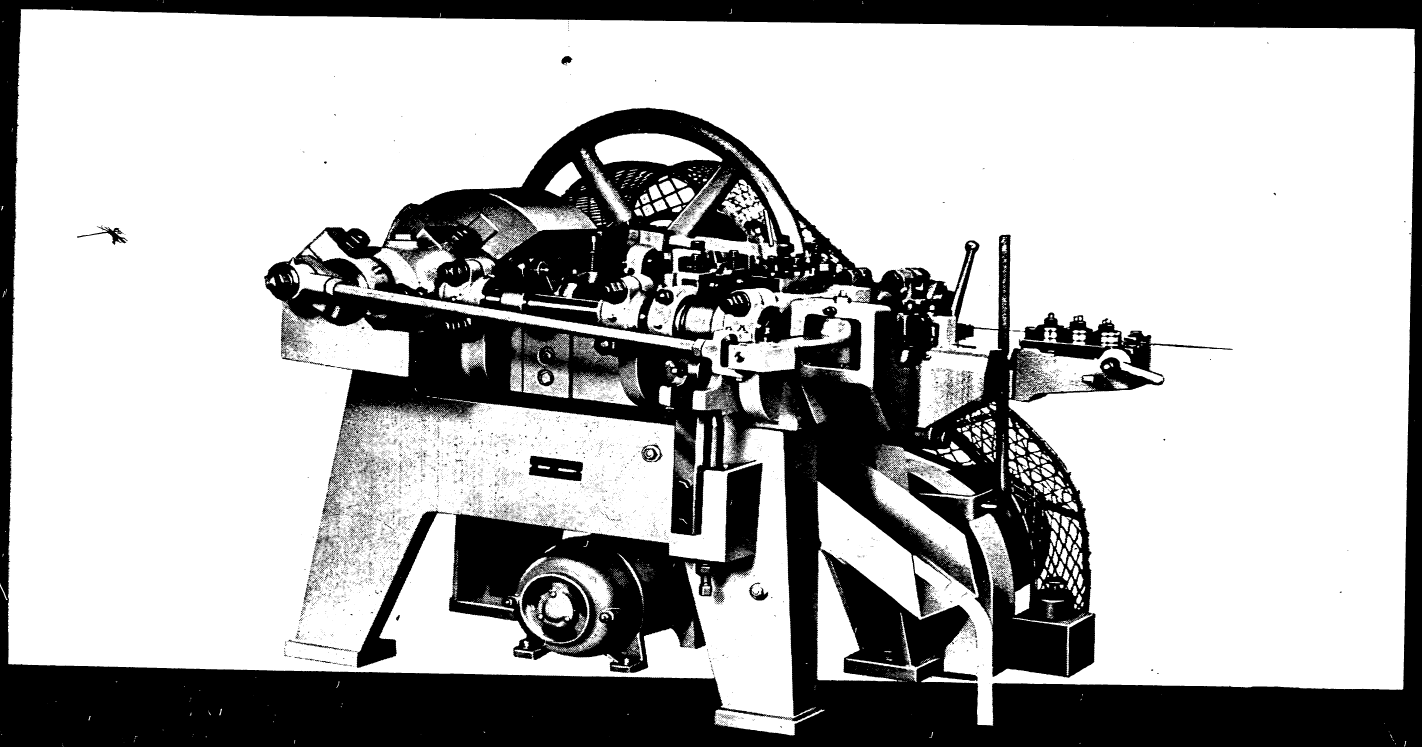
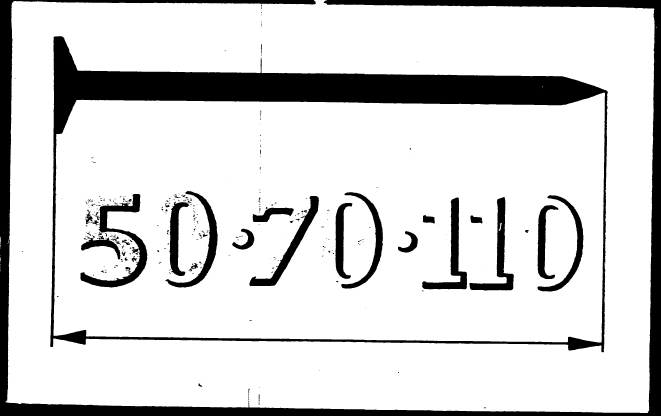


**HIGH-SPEED WIRE NAIL MACHINES Models**

# LHA

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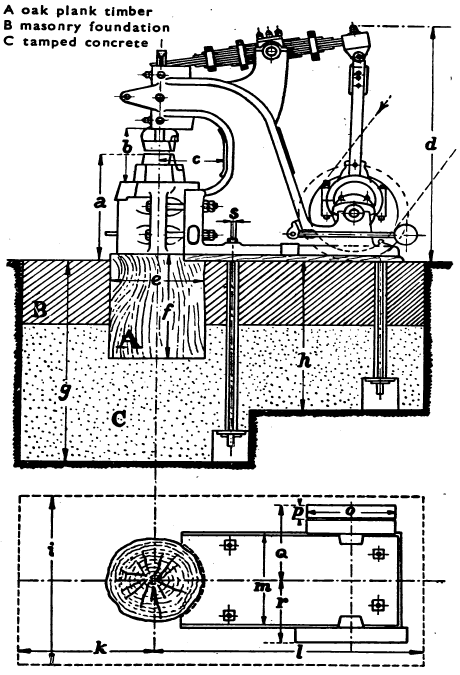
# SPECIFICATIONS

| Size of hammer | No. | 1 | 2 | 3 |
|---|---|---|---|---|
| Code word | | ADAM | ABEL | ALEX |
| Weight of ram | kg | 40 | 70 | 100 |
| Blows per minute | | 300 | 225 | 175 |
| Horsepower required | HP | 1—1 1/3 | 2—3 | 4—5 |
| Maximum stroke | mm | 150 | 220 | 280 |
| Size of stock: | | | | |
| Flat iron, up to the height of | mm | 70 | 100 | 130 |
| Square iron, up to | mm | 40 | 60 | 100 |
| Diameter and width of belt-pulley | mm | 350 × 65 | 400 × 100 | 600 × 110 |
| Length of ram guide | mm | 250 | 400 | 500 |
| Floorspace required | mm | 650 × 1200 | 800 × 1700 | 1000 × 2000 |
| Overall height, motor included | mm | 1600 | 2000 | 2500 |
| Dies: Standard length | mm | 125 | 180 | 200 |
| Maximum length | mm | 175 | 225 | 230 |
| Maximum width | mm | 150 | 180 | 130 |
| Weight of machine: | | | | |
| for line shaft drive | kg | 850 | 1900 | 3900 |
| for motor drive | kg | 935 | 1980 | 4150 |
| Motor: Output | HP | 2,5 | 4 | 7,5 |
| Speed | r. p. m. | 940 | 710 | 710 |
| Belt pulley, width × diam. | mm | 140 × 120 | 210 × 140 | 240 × 170 |

IN ORDERING, SPECIFY VOLTAGE, PHASE AND FREQUENCY OF POWER SUPPLY

As improvements in design are continually being made, this specification is not to be regarded as binding in detail, and dimensions are subject to alteration without notice.

A oak plank timber
B masonry foundation
C tamped concrete




| | Size 1 | 2 | 3 |
|---|---|---|---|
| a | 680 | 750 | 825 |
| b | 320 | 400 | 410 |
| c | 225 | 350 | 450 |
| d | 1300 | 1600 | 1800 |
| e | 400 | 500 | 650 |
| f | 500 | 600 | 800 |
| g | 650 | 1200 | 1550 |
| h | 650 | 1200 | 1150 |
| i | 700 | 800 | 1300 |
| k | 350 | 560 | 925 |
| l | 1000 | 1500 | 1800 |
| m | 450 | 600 | 700 |
| n | 300 | 225 | 175 |
| o | 350 | 400 | 600 |
| p | 65 | 100 | 110 |
| q | 325 | 410 | 580 |
| r | 260 | 330 | 480 |
| s | M 20 | M 24 | M 30 |

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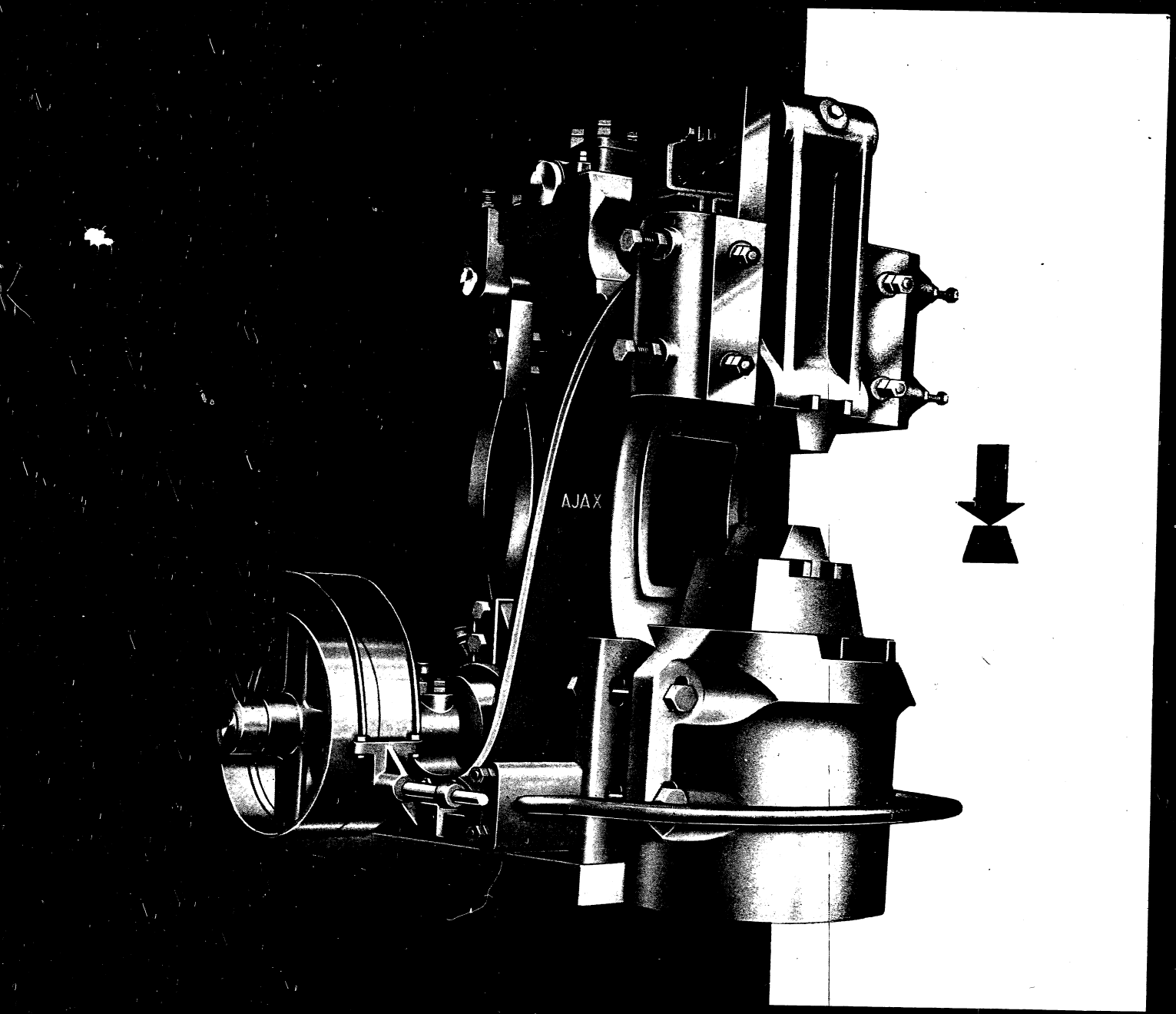


# SPRING HAMMERS

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The machine consists of a rugged column the upper part of which embodies the driving mechanism for the upper bending and grooving bar. In the lower part of the column an inclined arbour and the lower bending and grooving bar with its mechanism are mounted. The angular position of the bars and of the arbour enables the operation to be easily inspected. The power is transmitted by V-belts from an individual electric motor.

## STANDARD EQUIPMENT:

Electric motor with electrical equipment, set of V-belts, 1 bending bar either for internal or for external seams, set of spanners. Spare bending and grooving bars are supplied at an extra charge.

## SPECIFICATION:

| | | | |
|---|---|---|---|
| Max. length folded | mm | 539 | 20·8″ |
| Min. diameter of tin | mm | 120 | 4·7″ |
| Max. plate thickness | mm | 0·7 | 0·027″ |
| Electric motor: Output | HP | 3 | 3 HP |
| Speed | r. p. m. | 1400 | |
| Floor space required: length | mm | 650 | 25·5″ |
| width | mm | 1280 | 50″ |
| height | mm | 1750 | 69″ |
| Weight of machine | kg | 1500 | 3300 lbs |

All above data, dimensions and illustrations are not binding.

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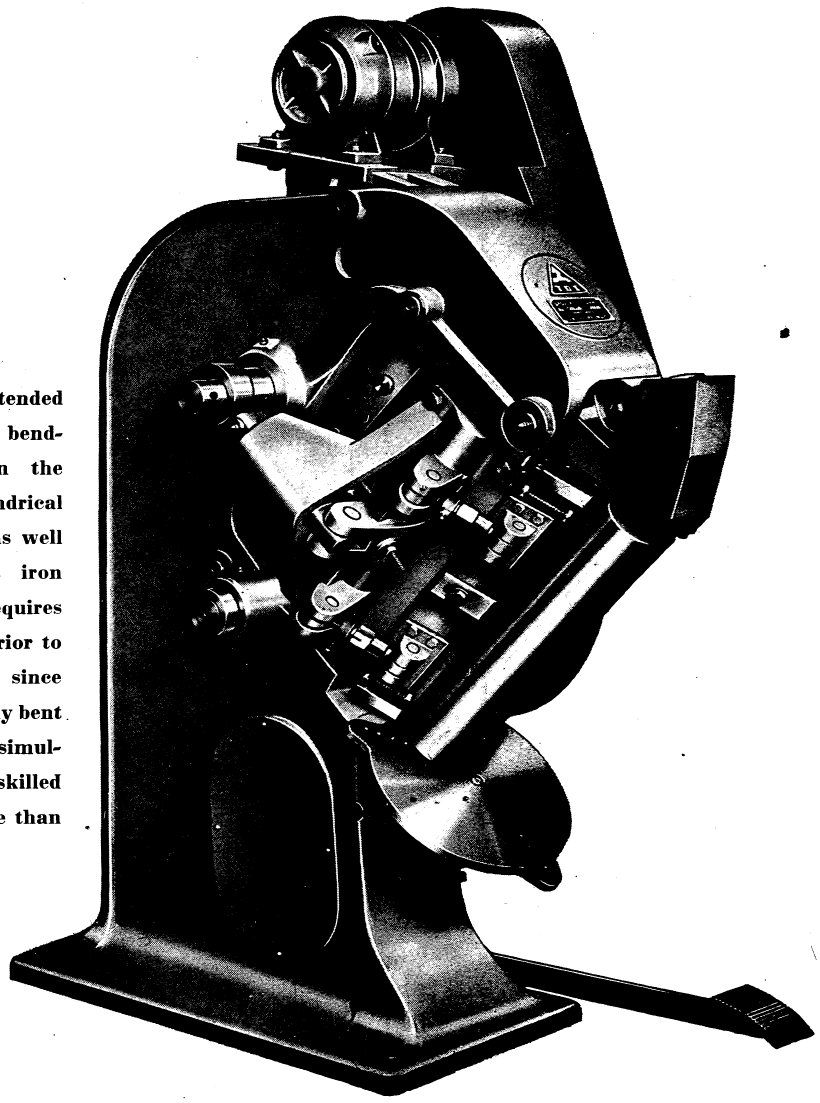

**This machine is intended exclusively for folding, bending and grooving in the manufacture of cylindrical and square type tins as well as for joining sheet iron plates. The sheet iron requires no special treatment prior to the folding operation, since after being automatically bent and folded, the sheet is simultaneously grooved. A skilled operator produces more than 1000 seams per hour.**

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# SPECIFICATION

D

| | | | |
|---|---|---|---|
| Diameter of spindle | mm | 160 | 6 5/16" |
| Taper in spindle | | Metric 100 | |
| Maximum torque: on spindle | kgcm | 25000 | 1820 ft. lbs |
| on face plate | kgcm | 80000 | 5790 ft. lbs |
| *Working Ranges:* | | | |
| Maximum diameter of boring with boring spindle | mm | 1000 | 3'3" |
| Maximum diameter of facing with face plate slide | mm | 1300 | 4'3" |
| Maximum sliding movement of spindle: basic | mm | 1200 | 3'11" |
| additional | mm | 600 | 1'11" |
| Axial movement of face plate | mm | 50 | 1 31/32" |
| Vertical movement of spindle head | mm | 2000 | 6'6" |
| Minimum height of centre-line of spindle above bed | mm | 800 | 2'8" |
| Minimum height of centre-line of spindle above clamping plate (normal) | mm | 410 | 1'4 1/2" |
| Cross movement of column on bed | mm | 3000 or 4500 | 9'10" or 14'9" |
| Diameter of face plate | mm | 810 | 3'7 1/2" |
| Height of bed | mm | 450 | 1'5 1/2" |
| *Speeds:* | | | |
| Spindle speeds arranged in 24 steps | r. p. m | 2.25 to 450 | |
| Face plate speeds arranged in 12 steps | r. p. m | 2.25 to 48 | |
| *Feeds:* | | | |
| 16 boring feeds of spindle | mm per rev. | 0.04 to 8 | 0.0016" to 0.32" per rev. |
| 8 milling feeds of head stock or column | mm per min. | 18 to 450 | 0.72" to 18" per min |
| 16 feeds of face plate slide | mm per rev. | 0.045 to 18 | 0.0018" to 0.72" per rev. |
| *Rapid Traverses:* | | | |
| Rapid outward movement of spindle | mm per min. | 4500 or 560 | 15' or 1'10" per min. |
| Rapid traverse of spindle head or column | mm per min. | 900 | 3' per min. |
| Rapid traverse of face plate slide | mm per min. | 670 | 2'2" per min. |
| Outward power movement of face plate | mm per min. | 25 | 1" per min. |
| *Screwcutting:* | | | |
| 22 metric threads with pitches of | mm | 0.5—12 | |
| 32 Whitworth threads with | t. p. i. | 28—1 | |
| *Drive:* | | | |
| Main motor: output | kW | 18 | |
| speed | r. p. m. | 940 | |
| *Dimensions and Weights:* | | | |
| Floor space of machine: | | | |
| with 3000 mm (9'10") movement of column on bed, approx. | mm | 5800 × 5750 | 19' × 18'10" |
| with 4500 mm (14'9") movement of column on bed, approx. | mm | 5800 × 7250 | 19' × 23'9" |
| Weight of machine with standard equipment: | | | |
| machine with 3000 mm (9'10") movement of column on bed, approx. | kg | 26500 | 58500 lbs |
| machine with 4500 mm (14'9") movement of column on bed, approx. | kg | 27600 | 60800 lbs |

*Standard equipment:*

Complete electrical equipment, face plate with slide for facing of flanges, measuring set with 2 dial-type error gauges for horizontal and vertical precision measurements, set of change gears for screwcutting, cooling equipment with electric motor driven pump and piping, indicating plates on machine, grease gun, spanners and cranks for maintenance, operator's instruction booklet.

*Special equipment:*

*Back rest with bed:*

| | | | |
|---|---|---|---|
| Movement of back rest on bed | mm | 1800 | 5'11" |
| Vertical movement of boring bar support on column | mm | 2000 | 6'6" |
| Motor for movement of column on bed: output | kW | 2 | |
| speed | r. p. m. | 1420 | |
| Motor for movement of boring bar support on column: output | kW | 1.2 | |
| speed | r. p. m. | 2800 | |
| Weight of back rest | kg | 5200 | 11500 lbs |

WHEN ORDERING, PLEASE STATE THE VOLTAGE AVAILABLE FOR THE ELECTRIC MOTORS.

The machines are continuously being improved upon. The particulars given in the prospectus are therefore not binding in detail.

**STROJEXPORT**

PRAHA - CZECHOSLOVAKIA

COK 520587 a - 5505

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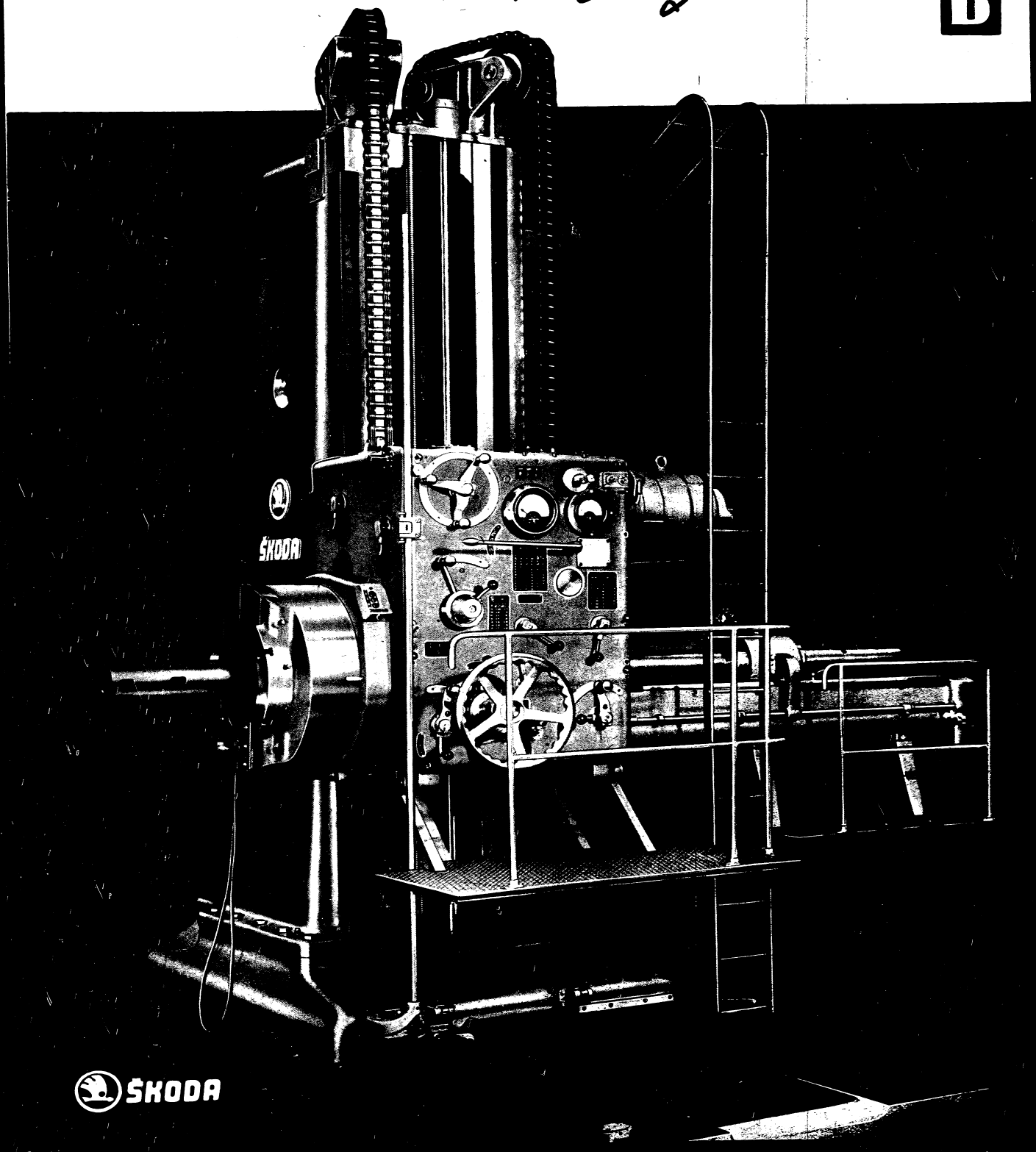
# Horizontal Bed Plate Type Boring Drilling and Milling Machine

**D**

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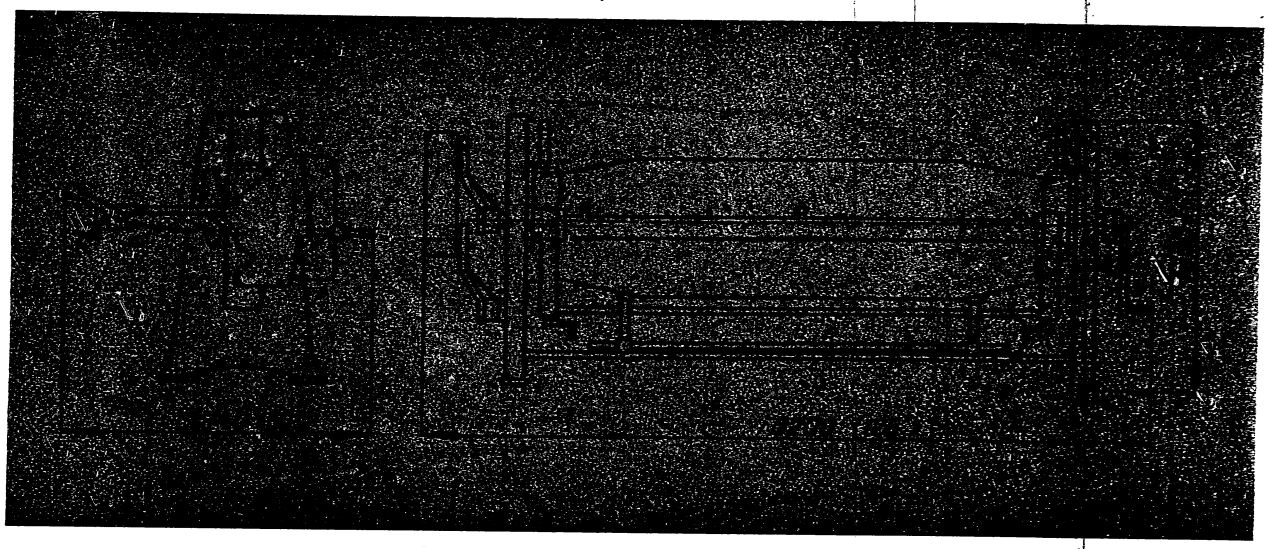

Standard Equipment

1 bulbing attachment
1 bar for sharp bends
1 bar for half-round bends
1 wooden roller dia. 75 mm
1 wooden roller dia. 100 mm
1 bulb iron dia. 16 mm
1 set of spanners
operating instruction booklet

Additional bars and bulb irons are supplied on special order at an extra charge.

**SPECIFICATIONS:**

| | | Metric | English |
|---|---|---|---|
| Working length | mm | 2040 | 80" |
| Maximum plate thickness (40 kg/mm² tensile) | mm | 2 | 0,08" |
| Stroke of upper bending cheek | mm | 90 | 3,5" |
| Adjustment of lower bending cheek | mm | 90 | 3,5" |
| Maximum diameter bent | mm | 180 | 7,1" |
| Weight of machine | kg | 1950 | 4300 lbs |
| Weight of machine with packing | kg | 2050 | 4500 lbs |
| Weight of machine with seaworthy packing | kg | 2300 | 5080 lbs |
| Dimensions of case | cm | 305×150×100 | 120"×59"×39" |
| Contents boxed | m³ | 4,5 | 160 cu. ft. |

As improvements in design are continually being made, this specification is not to be regarded as binding in detail, and dimensions are subject to alteration without notice.

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PRAHA * CZECHOSLOVAKIA

ČOK 52228-5408-Kt3-51-2421-(8958)

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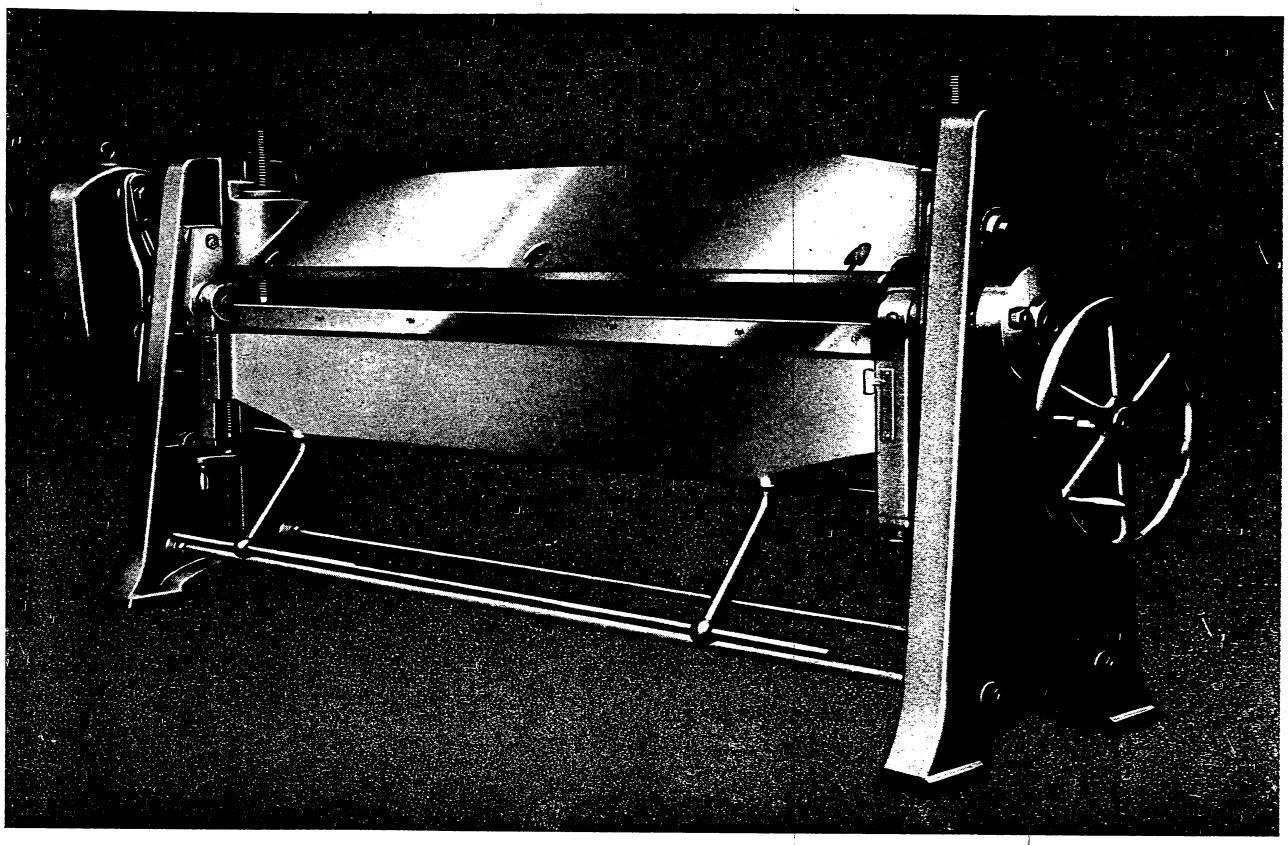

Model XK 200/2

# UNIVERSAL BENDING, BULBING AND ROUNDING MACHINE

This machine is especially suited for the hand bending of iron and steel sheets in the manufacture of cars, aircraft, safes, steel furniture, car bodies, in tinsmith's workshops, etc.

The sturdy construction of both columns and of the longitudinal box-type girders ensures a perfect performance of bends all over the working length. The upper bending cheek is elevated by a handwheel the elevating screws being mounted in ball bearings.

The lower bending cheek is horizontally adjusted by eccentric pins to the plate thickness and to the required radius of bend. The adjustment of the lower cheek to the radius of the pipe or trough to be bent is accomplished by hand cranks. The bending cheek is adequately balanced by a counterweight of new design which reduces the floor space of the machine. The machine is also adapted to the bending of pipes by means of a wooden roller. For making bulbs the slot for guiding the bulb iron is arranged directly in the table.

To obtain, in the mass production, all bulbs absolutely uniform the machine is fitted with an adjustable stop on its right-hand side.

The bending bars are inserted into the upper bending cheek and clamped by 3 bolts.

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The machines are driven by an electric motor the power of which is transmitted to the lower knife shaft through a multi-plate clutch and three reducing gears. The upper knife shaft is gear driven. Quick stopping of the machine is facilitated by a brake. The shaft of the third reducing gear is extended and fitted with a sprocket for a roller chain for the drive of a coiler. The strip of sheet metal is fed between the knives by means of adjustable bars and drawn out of the cut by passing between two rollers one of which is a driving one.

**STANDARD EQUIPMENT:**

For Type: NOP 50/3
4 circular knives
126 spacers 2 to 50 mm thick
10 feeding bars, long
5 feeding bars, short
spanners for attendance
hand grease gun
technical documents

For Type: NOP 75/3
4 circular knives
126 spacers 2 to 50 mm thick
spanners for attendance
hand grease gun
technical documents

**OPTIONAL EQUIPMENT:**

For Type: NOP 50/3
Disc knives to order
Unwinding and coiling equipment

For Type: NOP 75/3
Disc knives to order
Unwinding and coiling equipment

**SPECIFICATION:**

| Type | | NOP 50/3 | | | NOP 75/3 | |
|---|---|---|---|---|---|---|
| Maximum width of strip . . . | mm | 500 | 19 5/8" | mm | 750 | 29 1/2" |
| Clear width between housings . | mm | 600 | 23 5/8" | mm | 800 | 31 1/2" |
| Maximum thickness of sheets with: | | | | | | |
| 2 pairs of knives . . . . | mm | 3 | 11 S.W.G. | mm | 3 | 11 S.W.G. |
| 4 pairs of knives . . . . | mm | 2 | 14 S.W.G. | mm | 2 | 14 S.W.G. |
| 6 pairs of knives . . . . | mm | 1.5 | 17 S.W.G. | mm | 1.5 | 17 S.W.G. |
| 10 pairs of knives . . . . | mm | 1 | 19 S.W.G. | mm | 1 | 19 S.W.G. |
| 12 pairs of knives . . . . | mm | 0.75 | 22 S.W.G. | mm | 0.75 | 22 S.W.G. |
| Minimum width of strips cut . . | mm | 15 | 19/32" | mm | 15 | 19/32" |
| Cutting speed, per minute . . . | metres | 20 | 65' 7" | metres | 20.7 to 29.6 | 39' to 97'3" |
| Power of electric motor . . . | kW | 5.5 | | kW | 9.5 | |
| Weight of machine . . . . . | kg | 2300 | 5070 lbs | kg | 2950 | 6500 lbs |

PLEASE STATE IN YOUR ORDER THE VOLTAGE AVAILABLE FOR THE ELECTRIC MOTORS

The particulars stated in the prospectus are not binding in detail

**STROJEXPORT**
**PRAHA - CZECHOSLOVAKIA**

ČOK 53702 a - 5507 - Svět 06 592-55

Printed in Czechoslovakia

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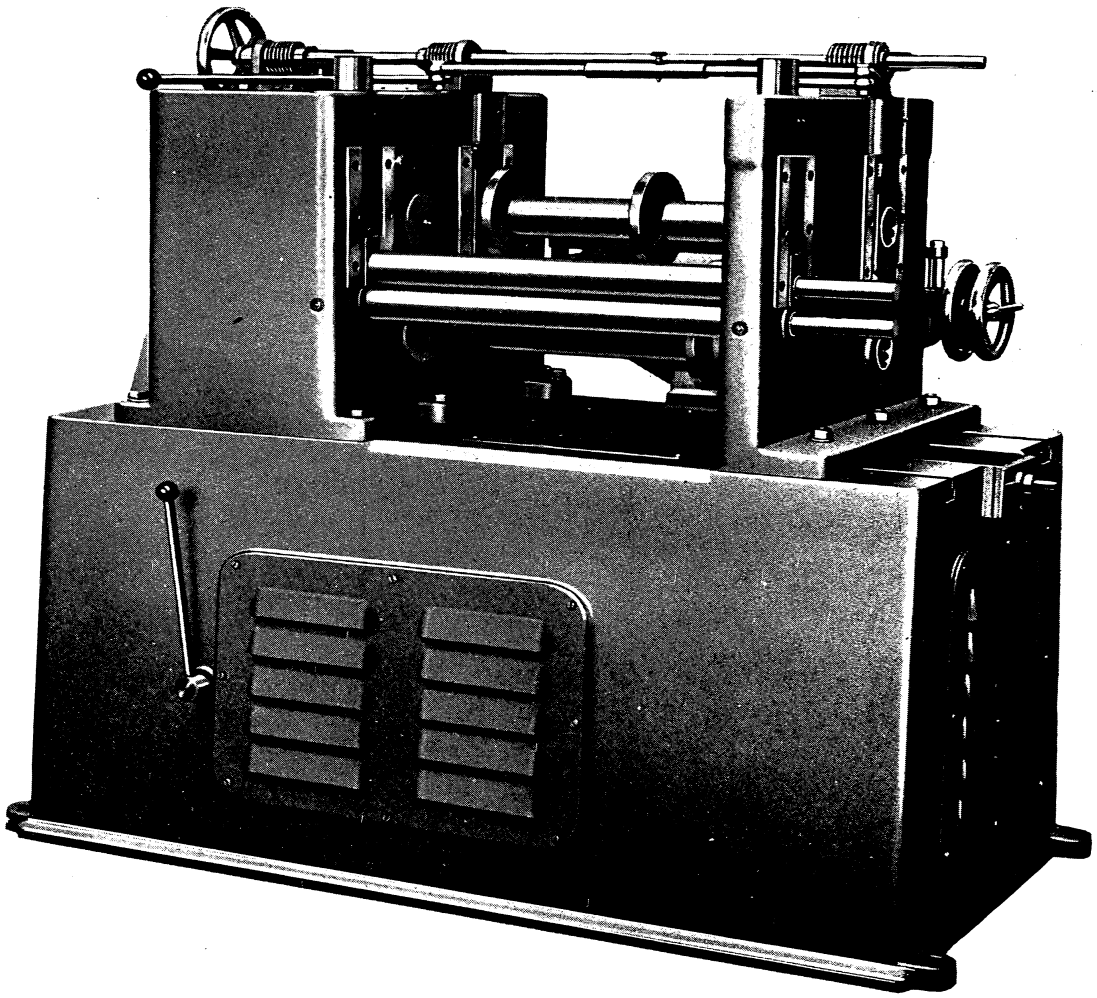
STROJEXPORT

# POWER DRIVEN STRIP SHEARS

## *Types NOP 50/3 and NOP 75/3*



**The machines are suitable for cutting a strip of sheet metal to two or more narrower strips. The width of the strips being cut is set by inserting spacers of various widths between the knives**

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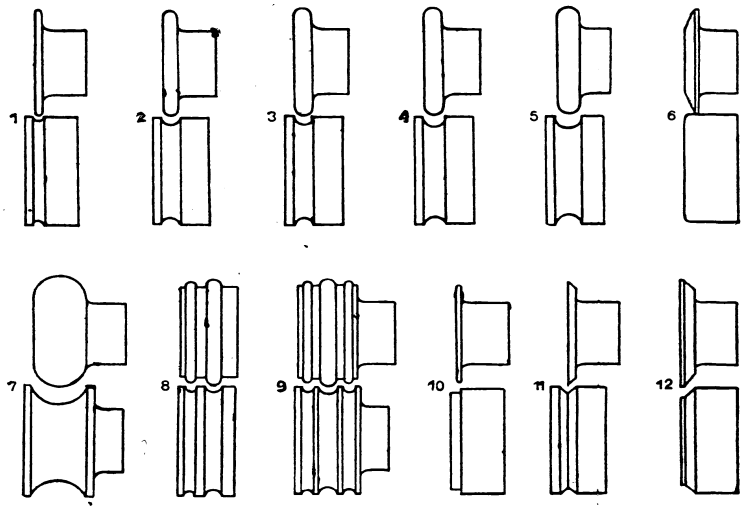
## THE PROFILES OF ROLLS SUPPLIED AS STANDARD EQUIPMENT




**On special order** and at an extra charge we supply additional forming rolls as **per drawings sent.**

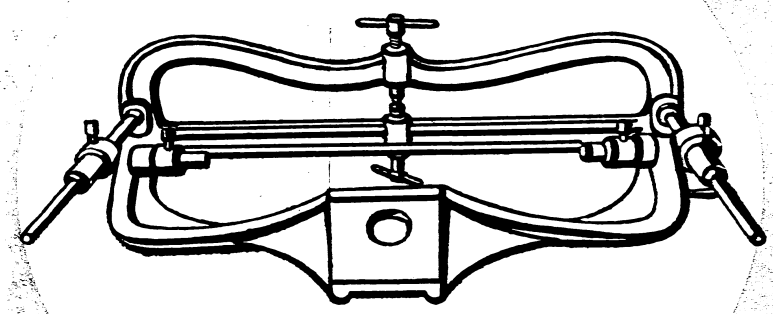
## THE CIRCULAR GUIDE

**As special equipment we supply the circular guide which is particularly used for knurling or ornament pressing of bottoms.**

| For machine | | For bottom diametres | | |
|---|---|---|---|---|
| XB | 50/190 | 90—495 mm | | |
| XB | 56/280 | 100—790 mm | | |
| XBM | 90/400 | 300—700 mm | | |
| XBM | 120/400 | 300—700 mm | 400—1000 | 400—1350 |
| XBM | 120/700 | 300—700 mm | 400—1000 | 400—1350 |
| XBM | 160/500 | 300—700 mm | 400—1000 | 400—1350 |

**In ordering, specify voltage, phase and frequency of power supply!**

**As improvements in design are continually being made, this specification is not to be regarded as binding in detail, and dimensions are subject to alteration without notice.**



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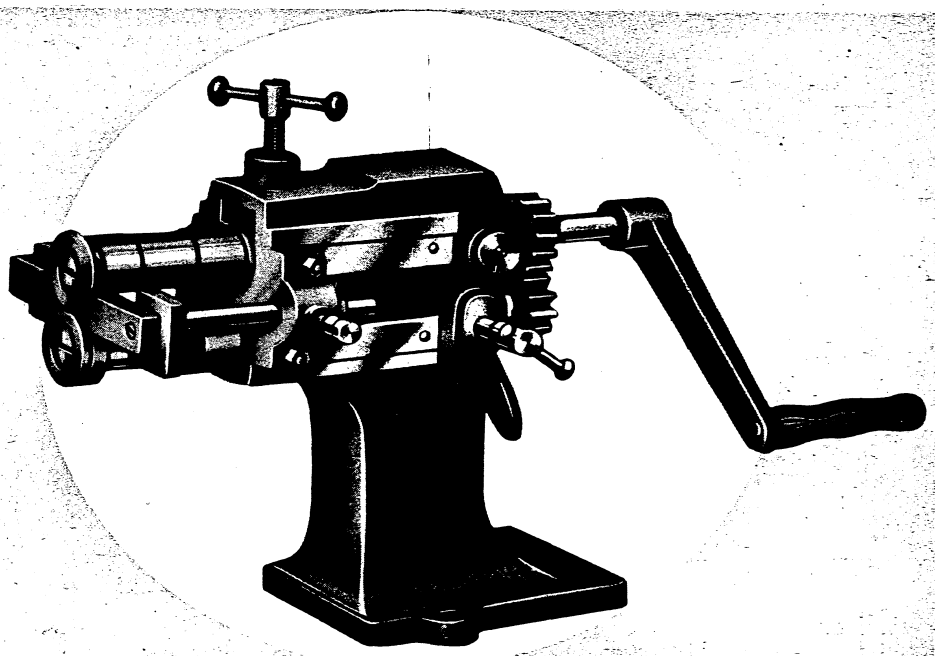
# BORDERING MACHINES FOR HAND DRIVE SERIES XB



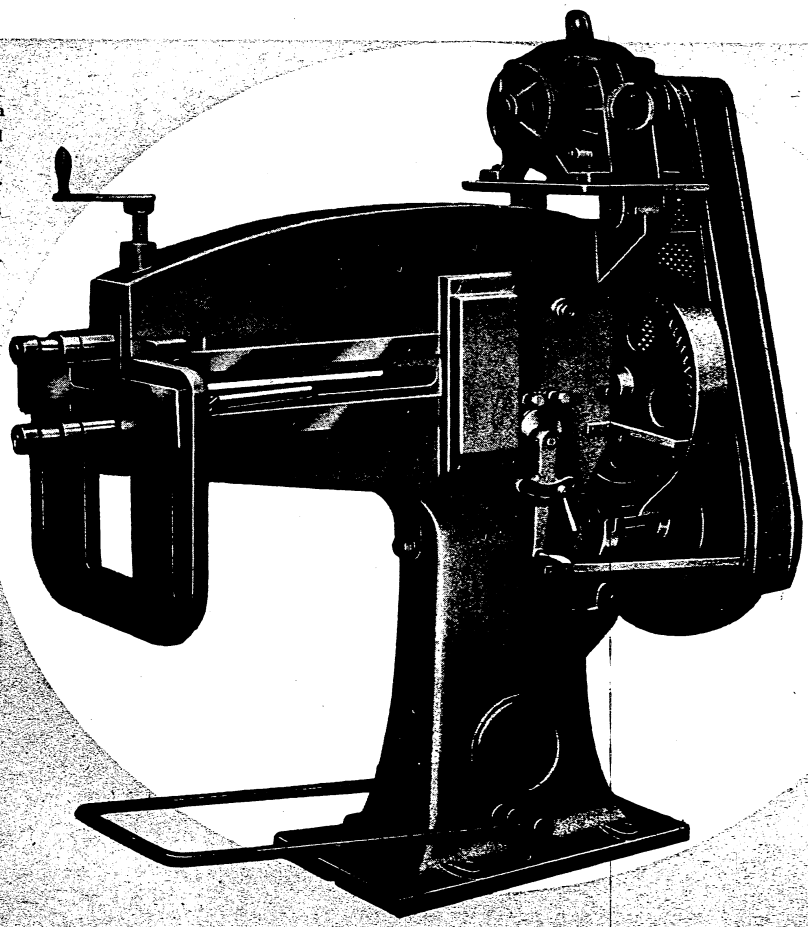
are particularly well-suited for tinsmith's shops. They may be used for bordering, folding, straightening, bottom tightening, wiring and ornament pressing.

The rolls on the last page of this prospectus are supplied as standard equipment.

The machines are made in 3 sizes:

| | | XB | XB | XB |
|---|---|---|---|---|
| Size | | 50/190 | 56/280 | 90/400 |
| Distance between centres of both rolls | mm | 50 | 56 | 90 |
| Working depth | mm | 190 | 280 | 400 |
| Weigth | kg | 25 | 60 | 230 |

# BORDERING MACHINES FOR POWER DRIVE SERIES XBM



These machines are provided with a motor, a transmission gear and a friction clutch, the latter enabling instantaneous starting or stopping of the machine by means of a foot lever. The shafts carrying the profile rolls are heavily dimensioned and adequately mounted in plain bearings. The bottom shaft is axially adjustable. A circular guide is supplied to special order.

The machines are made in four sizes:

| Size | | II | III | IV | V |
|---|---|---|---|---|---|
| Distance between centres of both rolls | mm | 90 | 120 | 120 | 160 |
| Maximum working depth | mm | 400 | 400 | 700 | 500 |
| Maximum plate thickness up to | mm | 1.5 | 2 | 2 | 3 |
| Net weight of machine approx. | kg | 230 | 345 | 480 | 1050 |
| Weight of circular guide approx. | kg | 60 | 95 | 95 | 180 |

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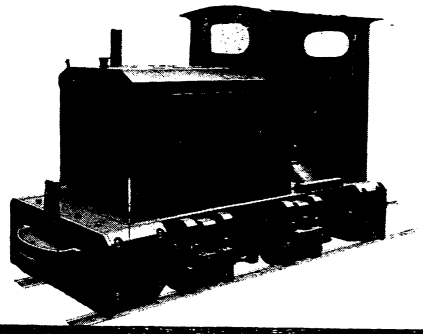
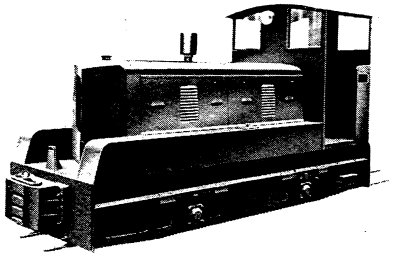
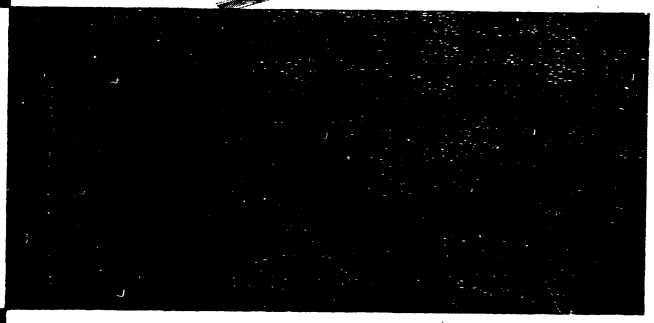
# NARROW GAUGE LOCOMOTIVES

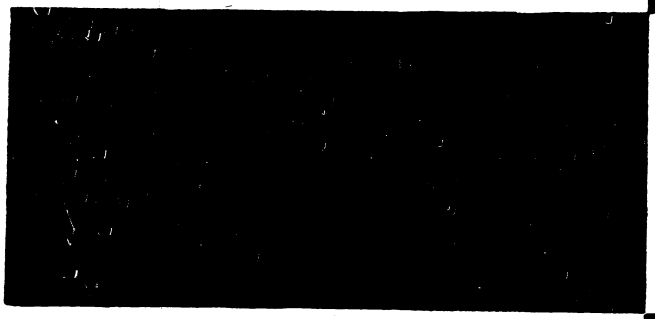
# STAVOLOKO ŠKODA

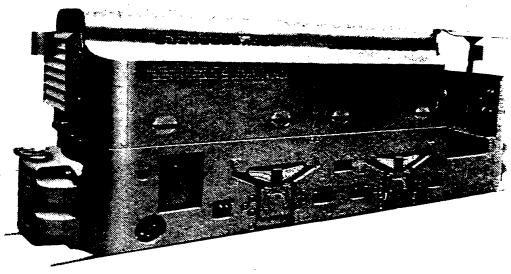
We also supply, apart from the type BN 60 Diesel locomotive, the following other types of narrow gauge locomotives:

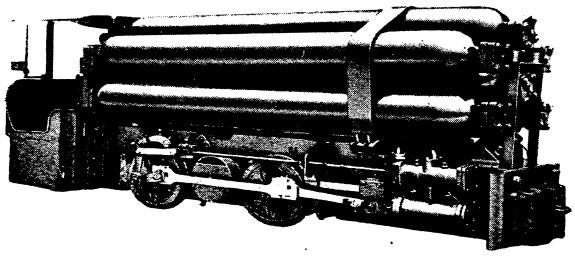












Any information which may be required and pamphlets will be sent on application by

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# SPECIFICATION:

| | | Metric | | British |
|---|---|---|---|---|
| **OPERATING DATA** | | | | |
| Gauge | mm | 600 to 900 | | 2'—3" |
| Minimum radius of track bend | m | 15 | | 49' |
| Maximum load on straight and level track | t | 199 | tons | 199 |
| Adhesive weight | t | 9,6 | tons | 9.6 |
| Axle load | t | 4,8 | tons | 4.8 |
| Number of speeds | | 3 | | 3 |
| I. gear: ratio | | 1:30 | | 1:30 |
| speed | km p. h. | 5.2 | mls/h | 3.2 |
| tractive effort on hook | kg | 2500 | lbs | 5500 |
| II. gear: ratio | | 1:16,25 | | 1:16.25 |
| speed | km p. h. | 9.5 | mls/h | 5.9 |
| tractive effort | kg | 1360 | lbs | 3000 |
| III. gear: ratio | | 1:6.9 | | 1:6.9 |
| speed | km p. h. | 22.5 | mls/h | 14 |
| tractive effort | kg | 575 | lbs | 1260 |
| Maximum speed | km p. h. | 22.5 | mls/h | 14 |
| Maximum tractive effort | kg | 2500 | lbs | 5500 |
| **DIMENSIONS OF LOCOMOTIVE** | | | | |
| Length over buffers | mm | 4250 | | 13' 11 3/8" |
| Height including roof of cab | mm | 2380 | | 7' 9 7/8" |
| Width | mm | 1000 | | 3' 3 5/16" |
| Wheelbase | mm | 1100 | | 3' 8 3/16" |
| Diameter of wheels | mm | 550 | | 1' 9 21/32" |
| **DATA OF DIESEL ENGINE** | | | | |
| Type | | Škoda 4 S 110 | | Škoda 4 S 110 |
| Number of cylinders | | 4 | | 4 |
| Bore | mm | 110 | | 4 21/64" |
| Stroke | mm | 150 | | 5 29/64" |
| Output at 1500 r. p. m. | HP | 60 | | 60 |
| Fuel consumption at 100% load | grs/HP/h | 180 ± 5% | grs/HP/h | 180 ± 5% |
| Lubrication oil consumption | grs/HP/h | 3—5 | grs/HP/h | 3—5 |
| **OTHER DATA** | | | | |
| Starting: starter type | | PAL 02-9087.02 | | PAL 02-9087.02 |
| output | W | 300 | W | 300 |
| voltage | V | 24 | V | 24 |
| speed | r. p. m. | 1200 | r. p. m. | 1200 |
| Battery: Type | | 6 E 7 | | 6 E 7 |
| voltage | V | 2×12 | V | 2×12 |
| capacity | Ah | 105 | Ah | 105 |
| Cooler: Type | | PAL DN 1095 | | PAL DN 1095 |
| cooling capacity | kcal/h | 36.000 | B.T.U./h | 142.500 |
| capacity of cooling water tank | litres | 23 | Imp. gall. | 5 |
| weight | kg | 56 | lbs | 123 |
| Fuel tank: capacity | litres | 60 | Imp. gall. | 10.6 |
| Brake: number of blocks | | 4 | | 4 |
| method of control | | by hand | | by hand |
| system | | lever | | lever |
| Chain: pitch | mm | 57.2 | | 2 5/16" |
| diameter of roller | mm | 34.3 | | 1 11/32" |
| number of links | | 36 | | 36 |
| Springs: leaves | mm | 50×8 | | 1 31/32" × 5/16" |
| number of leaves | | 13 | | 13 |

**The machines are continuously being improved upon. The data in the prospectus are not binding in details.**

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ted one sander operated from the driver's cab. The sand
sides so that, in either direction of travel, sand is intro-

airs by means of two blocks.

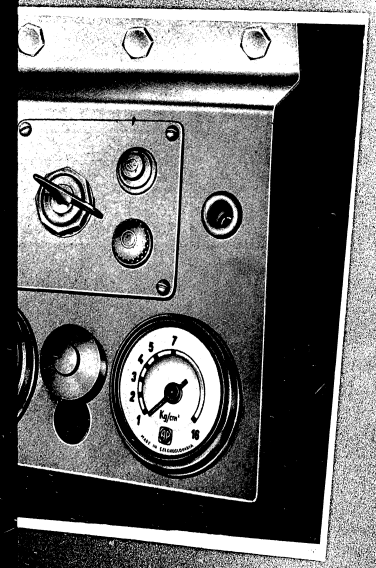
## COMOTIVE

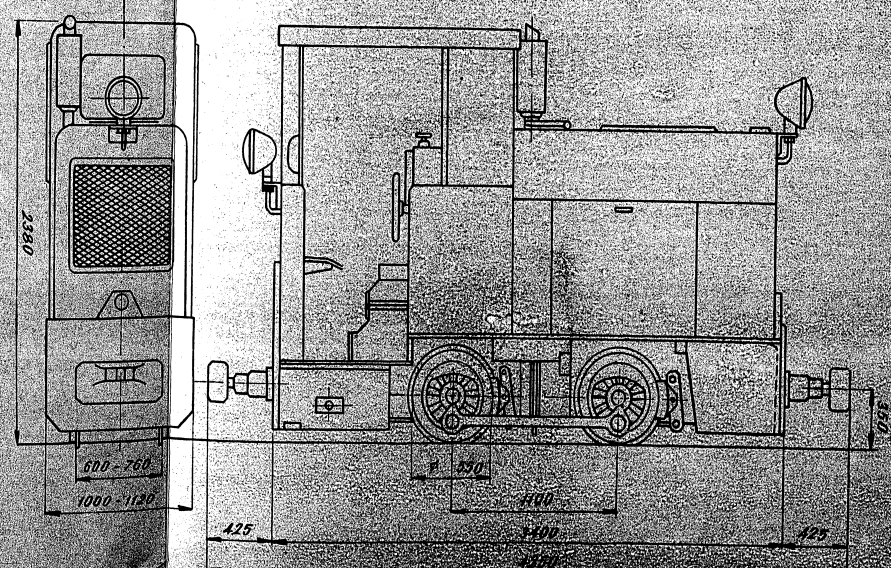
in the price of the locomotive: starting handle, set of
, two pairs of pliers, chisel, punch, grease gun, oil can,
ies and minimum set of spare parts of Diesel Engine,
locomotive.

### TABLE OF APPROXIMATIVE GROSS LOADS IN TONS

The figures as stated base on a basic track resistance of 10 kg per ton (1 lb per 100 lbs) up to an altitude of 250 metres (820 ft) and a temperature of 25° C (77° F).

| Speed | km/h<br>mls/h | 4,3<br>2,7 | | | | | 7,2<br>4,5 | | | | | 11,6<br>7,2 | | | | | 16,3<br>10,0 | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Tractive effort on hook | kgs<br>lbs | 2000<br>4410 | | | | | 1630<br>3395 | | | | | 960<br>2115 | | | | | 660<br>1455 | | | | |
| Loads in metric tons at gradients | ‰ 1 : ∞ | 199 | 178 | 160 | 150 | 120 | 163 | 144 | 128 | 120 | 97 | 96 | 84 | 75 | 70 | 55 | 66 | 58 | 52 | 47 | 37 |
| | 2 ‰ 1 : 500 | 172 | 156 | 140 | 132 | 108 | 138 | 124 | 113 | 105 | 85 | 80 | 72 | 65 | 60 | 49 | 55 | 49 | 43 | 41 | 32 |
| | 2,5‰ 1 : 400 | 165 | 148 | 132 | 126 | 103 | 135 | 120 | 109 | 100 | 84 | 78 | 70 | 63 | 59 | 48 | 54 | 48 | 42 | 40 | 31 |
| | 3 ‰ 1 : 300 | 156 | 138 | 127 | 120 | 100 | 126 | 114 | 104 | 97 | 82 | 73 | 66 | 60 | 56 | 45 | 50 | 45 | 41 | 37 | 30 |
| | 5 ‰ 1 : 200 | 138 | 126 | 115 | 110 | 92 | 115 | 103 | 95 | 89 | 75 | 65 | 59 | 54 | 49 | 42 | 44 | 40 | 36 | 34 | 28 |
| | 10 ‰ 1 : 100 | 105 | 98 | 90 | 87 | 75 | 85 | 79 | 73 | 70 | 61 | 48 | 45 | 41 | 38 | 34 | 32 | 31 | 26 | 25 | 22 |
| | 16,6‰ 1 : 60 | 78 | 74 | 72 | 68 | 60 | 62 | 60 | 56 | 54 | 48 | 35 | 32 | 31 | 29 | 25 | 23 | 20 | 19 | 18 | 15 |
| | 20 ‰ 1 : 50 | 70 | 65 | 63 | 60 | 55 | 55 | 53 | 49 | 48 | 43 | 30 | 29 | 26 | 25 | 23 | 19 | 18 | 17 | 15 | 13 |
| | 33,3‰ 1 : 30 | 48 | 45 | 42 | 40 | 37 | 36 | 35 | 33 | 32 | 30 | 18 | 17 | 16 | 15 | 14 | 11 | 9 | 9 | 8 | 7 |
| Radius of bend track | m<br>ft. | ∞<br>∞ | 100<br>328 | 50<br>164 | 40<br>132 | 20<br>66 | ∞<br>∞ | 100<br>328 | 50<br>164 | 40<br>132 | 20<br>66 | ∞<br>∞ | 100<br>328 | 50<br>164 | 40<br>132 | 20<br>66 | ∞<br>∞ | 100<br>328 | 50<br>164 | 40<br>132 | 20<br>66 |

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## THE SANDER

At each side of the frame is fitted one sander operated from the driver's cab. The sand is dropped on the rails at both sides so that, in either direction of travel, sand is introduced under both wheels.

## THE BRAKE

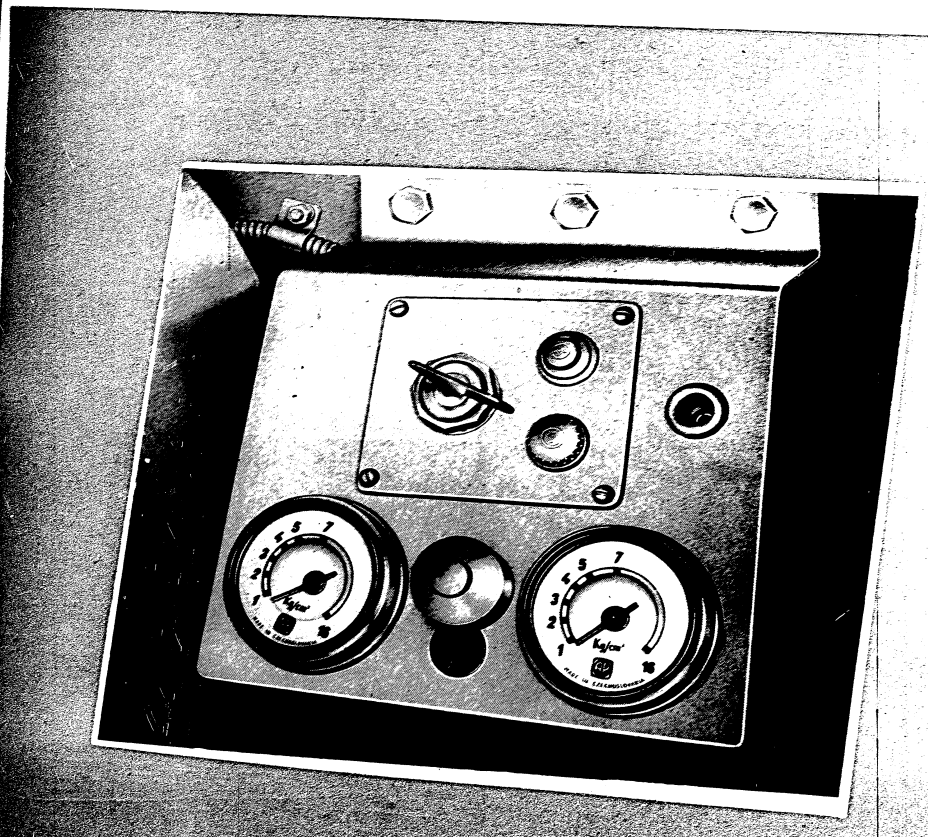
The brake acts upon both wheelpairs by means of two blocks.

## ACCESSORIES OF LOCOMOTIVE

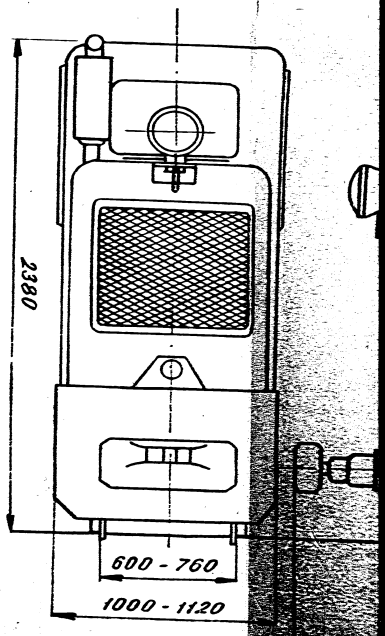
The following items are included in the price of the locomotive: starting handle, set of spanners, monkey-wrench, hammer, two pairs of pliers, chisel, punch, grease gun, oil can, lock for tool box, small accessories and minimum set of spare parts of Diesel Engine, mechanical and electrical part of locomotive.

The figures as stated base on

| | | | | | |
|---|---|---|---|---|---|
| Speed | | km/h | | | 4 |
| | | mls/h | | | 2 |
| Tractive effort on hook | | kgs | | | 200 |
| | | lbs | | | 44 |
| Loads in metric tons at gradients | ‰ | 1 : ∞ | 199 | 178 | 160 |
| | 2 ‰ | 1 : 500 | 172 | 156 | 140 |
| | 2,5‰ | 1 : 400 | 165 | 148 | 132 |
| | 3 ‰ | 1 : 300 | 156 | 138 | 127 |
| | 5 ‰ | 1 : 200 | 138 | 126 | 115 |
| | 10 ‰ | 1 : 100 | 135 | 98 | 90 |
| | 16,6‰ | 1 : 60 | 78 | 74 | 72 |
| | 20 ‰ | 1 : 50 | 70 | 65 | 63 |
| | 33,3‰ | 1 : 30 | 48 | 45 | 42 |
| Radius of bend track | | m | ∞ | 100 | 50 |
| | | ft. | ∞ | 328 | 164 |



Control Apparatus

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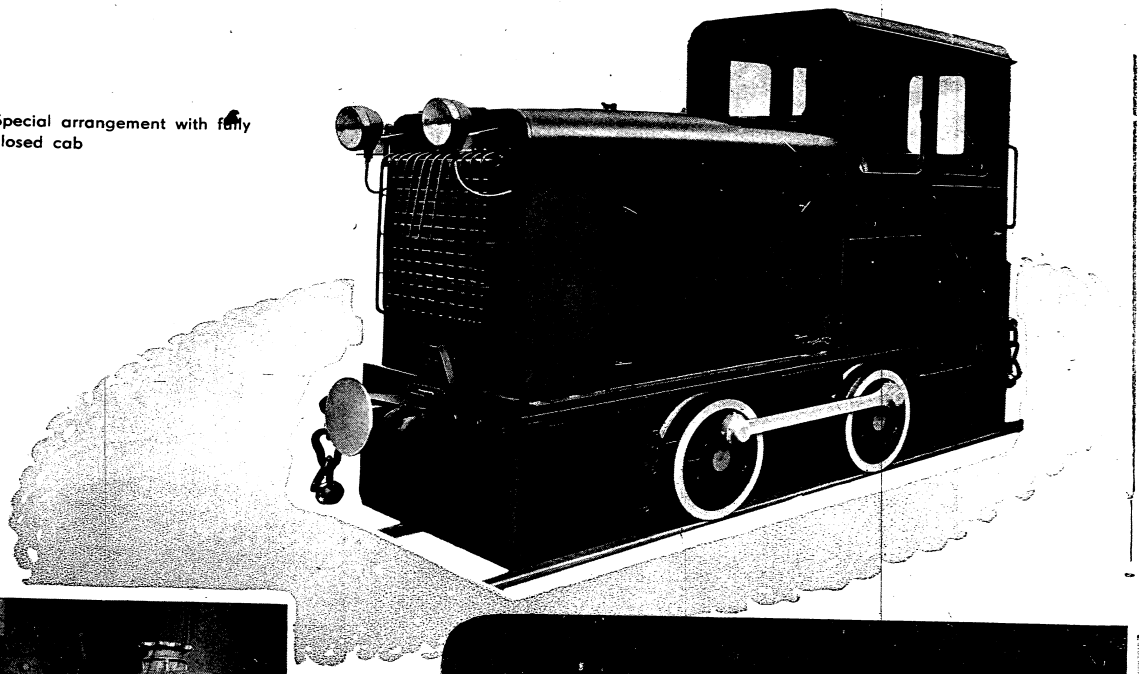
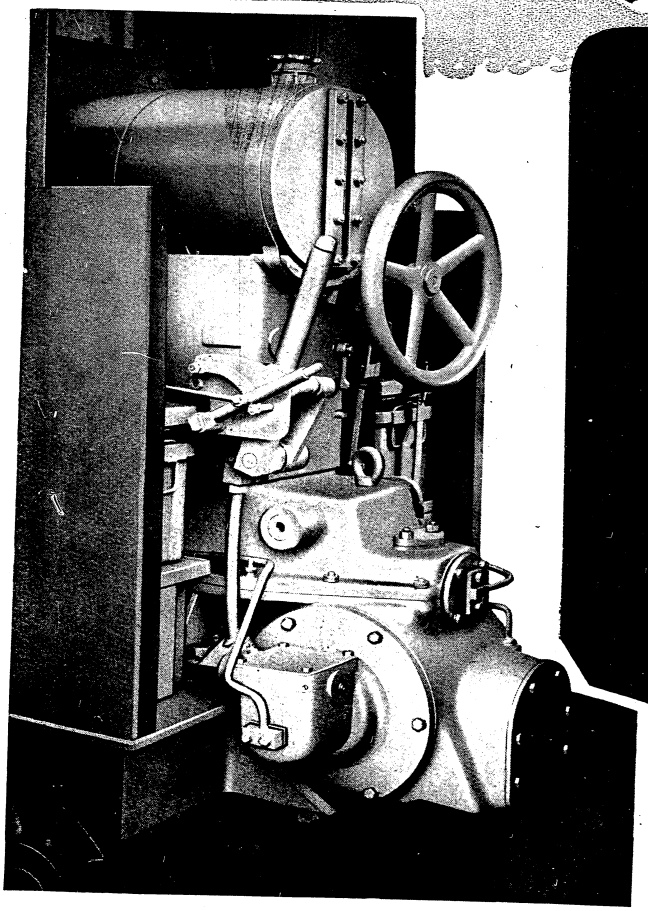
Special arrangement with fully closed cab





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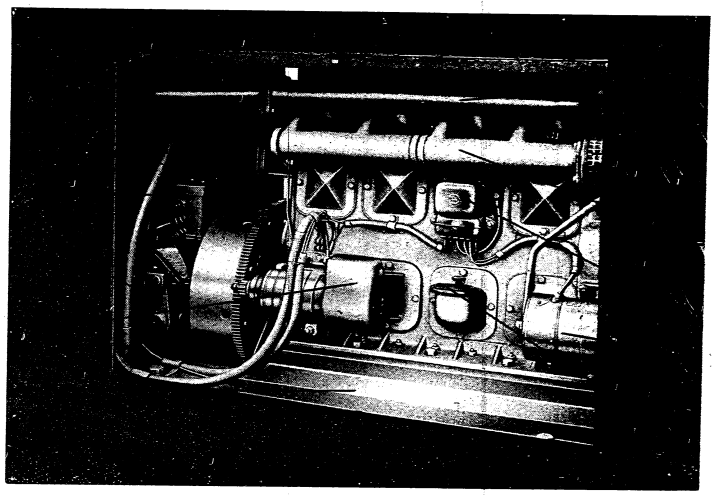
View of right hand side of locomotive with cover removed:

1. Carrying Frame
2. Electric Starter
3. Gear Control Lever
4. Gear Box Oil Cleaner
5. Sander Tubes
6. Sand Tank
7. Exhaust Piping
8. Suction Cleaner
9. Suction Piping
10. Charging Regulator
11. Charging Dynamo
12. Oil Filling Opening



## SPECIAL ARRANGEMENT

On special request the locomotive can be supplied with doors on the driver's cab, a Venetian blind in front of the radiator and two headlights, or in another arrangement as specified by the customer.

## LUBRICATION

A lubricating oil gear pump driven by the crankshaft supplies pressure oil to the distributing piping through a lamination type filter which can be cleaned even while the engine is running. The lubricating oil consumption at full load is 3 to 5 grammes per HP per hour. The oil pressure is adjusted by means of an adjusting screw and checked on a pressure gauge in the driver's cab.

## COOLING

The engine is water cooled and equipped with a centrifugal cooling water pump, motor vehicle type radiator and fan. The water pump and fan are driven by the crankshaft by means of V-belts. The radiator is fitted in front of the engine.

## STARTING

The engine is started by an electric starter fed from the accumulator battery. In an emergency the engine can be cranked by hand.

## THE ELECTRICAL EQUIPMENT

consists of: charging dynamo, accumulator battery of 105 Ah capacity, starter, electric lighting, portable lamp and wiring. The voltage of the electrical equipment is 24 Volts.

## THE GEAR BOX

The components of the gear box are manufactured with great precision with a view to easy replacement of worn parts. They are marked with consecutive numbers according to a numerical list in order to obviate the possibility of an error when ordering spare parts. The gears are precisely machined, cemented and hardened and run in an oil bath, or are force lubricated by an oil pump protected by a filtering grid. The multi-plate clutches reliably transmit the driving power of the respective speeds without slipping. The disc-type coupling is balanced statically and dynamically. The oil level is checked by means of an indicator. All screws and nuts are secured by spring washers. All gears are controlled by one handwheel with an indicator of the gear engaged. The direction of travel can only be changed when the locomotive is at rest and the engine running at low speed.

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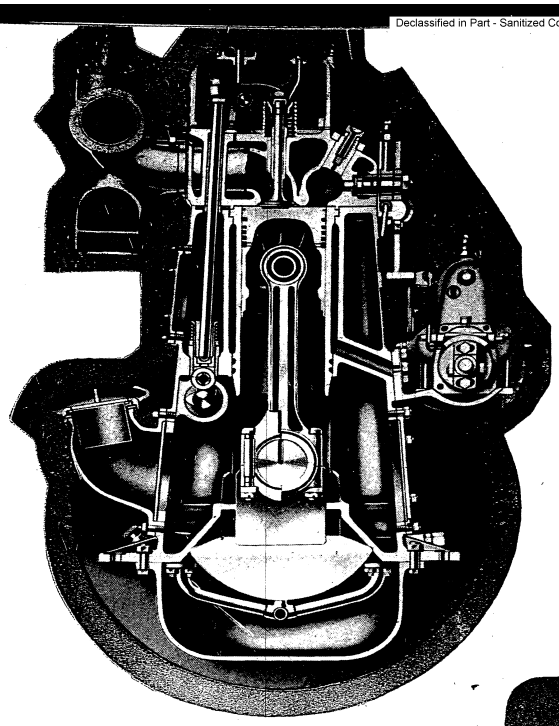
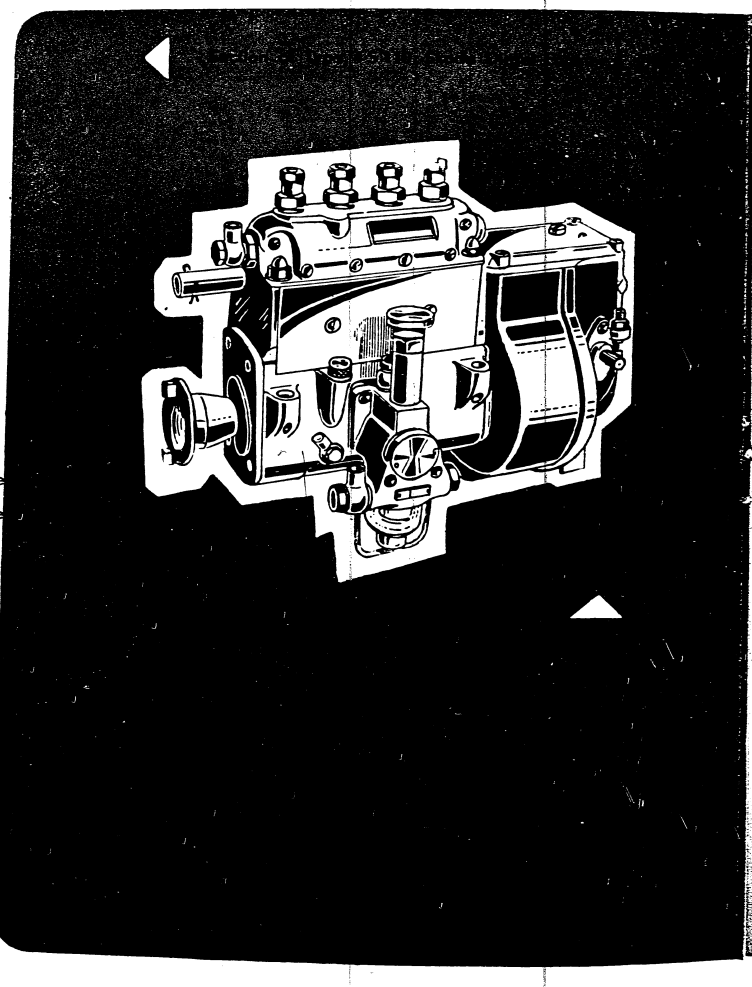


## THE ENGINE

The locomotive is driven by a vertical high speed compressorless four cylinder four-stroke Škoda-Diesel engine, Type 4 S 110, of an output 60 HP at 1500 r. p. m. The fuel is injected into a pre-combustion chamber of the engine by a high pressure fuel injection pump. The special shape of the pre-combustion chambers causes a lively turbulence of the compressed air resulting in perfect combustion even though the load or speed of the engine may vary. The engine is marked by simple and easy attendance. The moving parts are completely enclosed, yet easily accessible. Precision manufacture according to a system of fits affords easy replacement of worn parts. The cylinder liners are exchangeable.

View of r
locomotiv

1. Carryi
2. Electri
3. Gear
4. Gear
5. Sande
6. Sand
7. Exhau
8. Suctio
9. Suctio
10. Charg
11. Charg
12. Oil Fi



## THE FUEL INJECTION PUMP

The PAL fuel injection pump operates with the
mencement of injection fixed in relation to the
tion of the piston in the cylinder. The nece
quantity of fuel corresponding to the mome
load is adjusted by the governor.

## THE FUEL

is supplied to the fuel injection pump from
of 10000 kcal per kg. - (18000 B. T. U. per lb.) ar
The fuel consumption under normal operating

Load . . . . . .
Fuel consumption . . . . . .

The above figures are subject to a tolerance o

SPECI
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the radiat

LUBRI
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nation typ
load is 3
on a press

COOL
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fan. The w
engine.

START
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THE G
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All gears
only be ch

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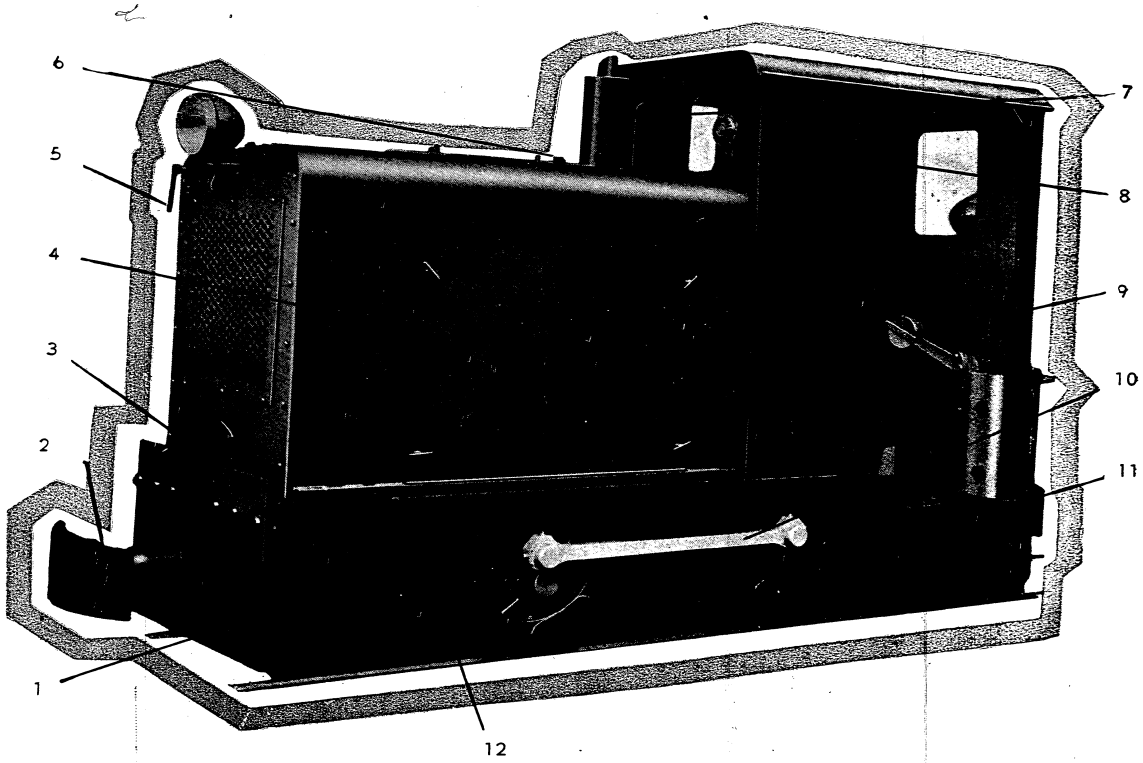
## DESCRIPTION

The engine is mounted in the front part of the frame and drives a gear box through a flexible coupling. The transmission of driving power from the gear box to the rear axle is effected by means of sprocket pinions, sprocket wheels and roller chains. Both wheelpairs are spring mounted and coupled by means of coupling rods. The radiator is arranged in front of the engine. The radiator, engine and gear box are protected against damage by covers. Removable side covers afford easy access to the entire driving gear. The driver's cab is open at both sides. In case the engine is expected to work on lines with a restricted clear height (tunnel construction work, etc.) the locomotive can be supplied without the cab. The dimensions of the cab permit the driver to be seated when driving, or to stand when the view of the line is poor.

1. Ballast Weight
2. Buffer
3. Crank Handle Guide
4. Engine Side Cover
5. Decompressor Lever
6. Sand Filling Opening
7. Exhaust Silencer
8. Electric Horn
9. Hand Brake Lever
10. Wheelpair Coupling Rod
11. Sander Tube
12. Brake Suspensions

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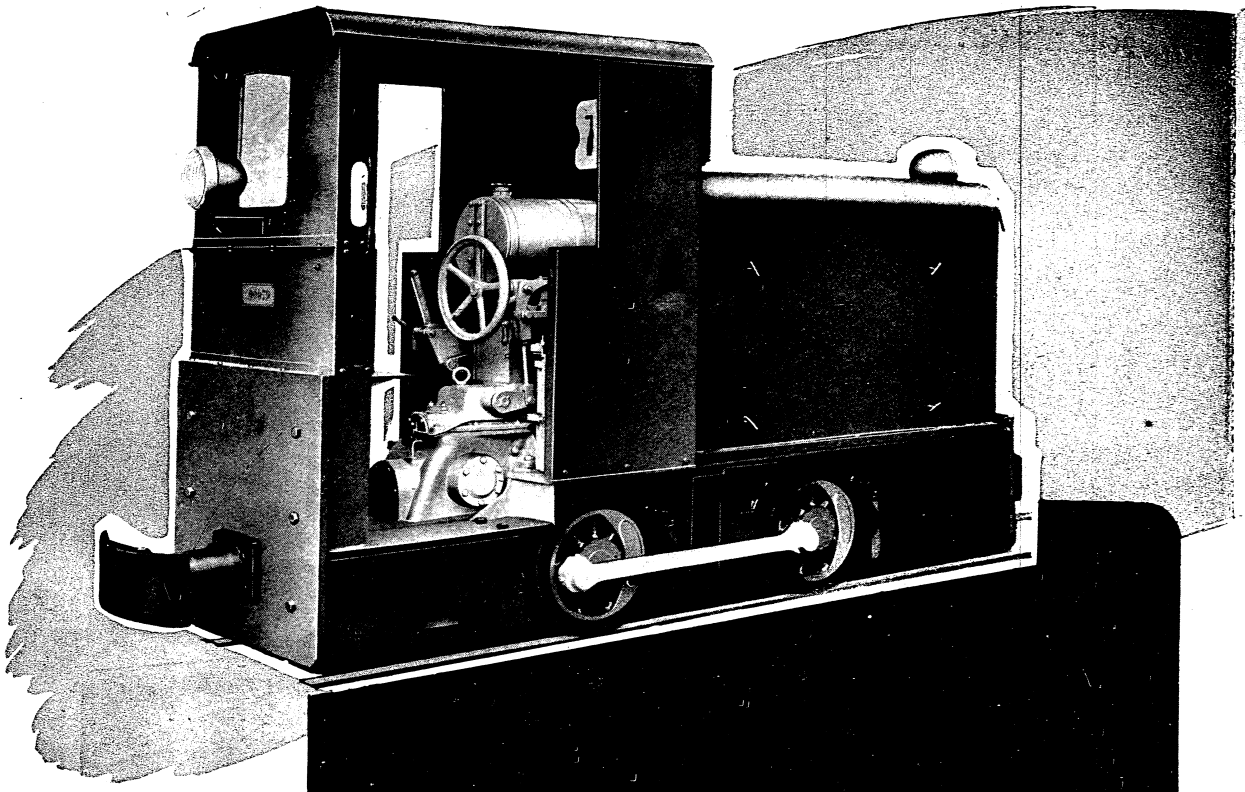

# BN 6

## DESC

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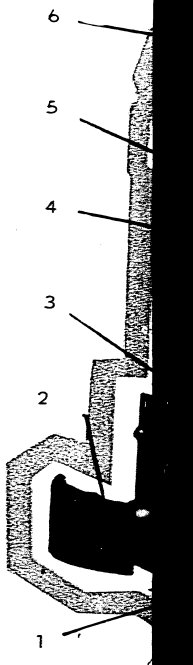
1. Ballast
2. Buffer
3. Crank
4. Engine

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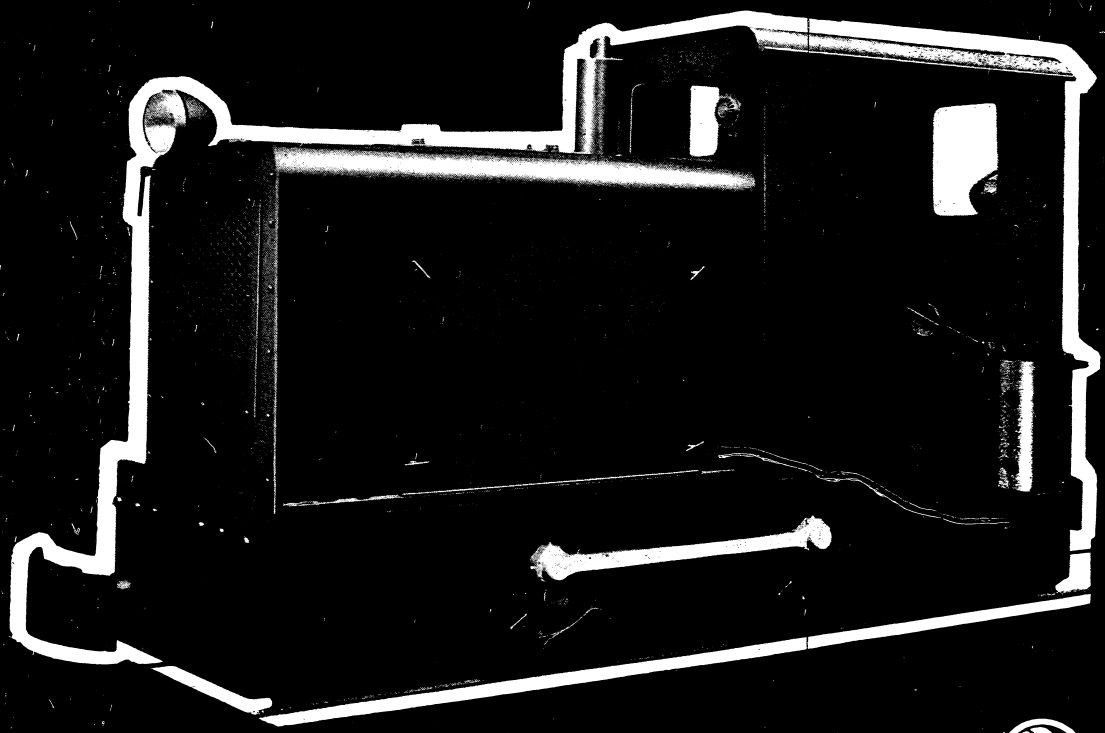
# BN 60



ŠKODA · STAVOLOKO

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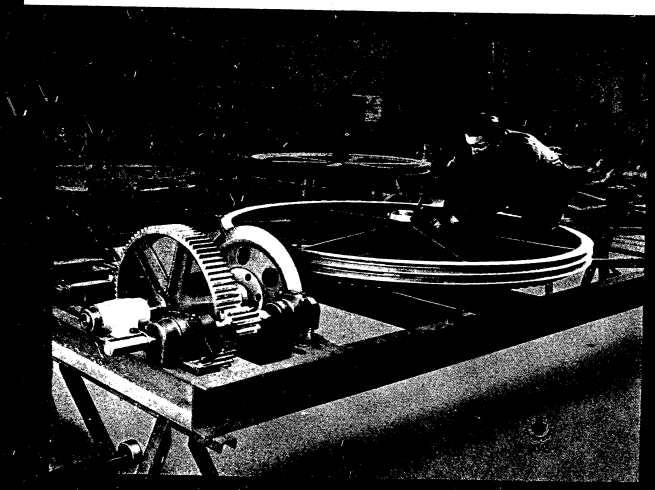
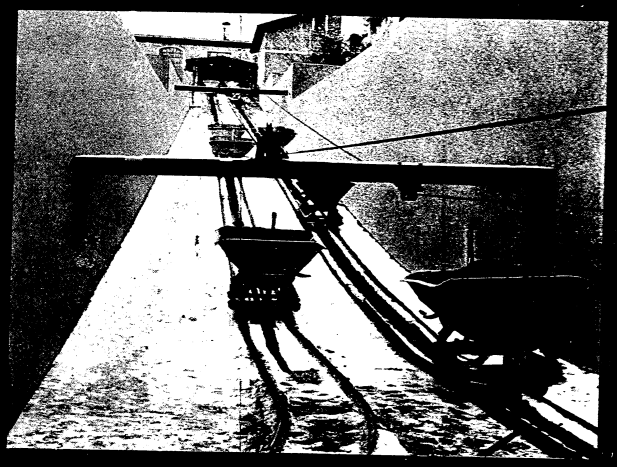
Řetěz může býti i nekalibrovaný, o normalisované síle článků 16 mm a o vnitřních rozměrech 50×20 mm. Protáhne-li se řetěz časem, nutno jej zkrátit.

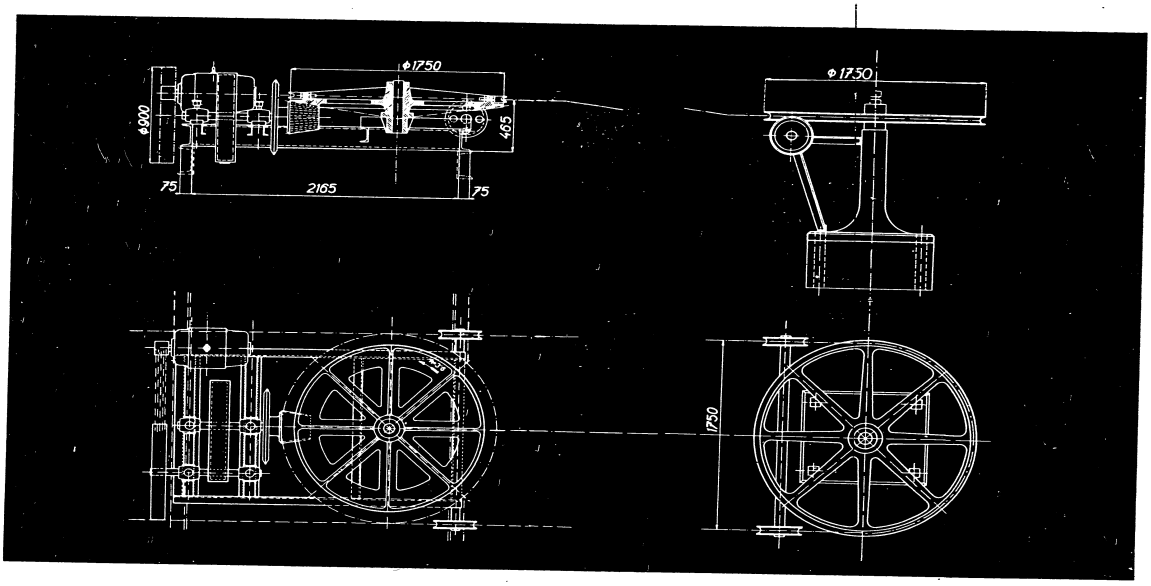
Výtah pracuje nepřetržitě, t. j. hlínou naplněné překlopné vozíky jsou zaklesnuty na tažnou větev řetězu, dopraveny do lisovny, v žádoucím místě se samočinně vypnou a po vyprázdnění se zaklesnou na vratnou větev řetězu a vrací se po druhé koleji zpět do hliníku.

Stoupání dráhy pohybuje se v mezích 1 : 7 až 1 : 10. Rozchod kolejí je 600 mm, vzdálenost os kolejí 1750 mm.





Spotřeba hnací síly je závislá na sklonu dráhy a na počtu dopravovaných vozíků, je však poměrně malá, kdežto úspora na pracovních silách a čase je značná. Místo řetězu možno použíti lana s příslušnou úpravou tažného kola. Jinak provedení výtahu zůstává v podstatě stejné.




Tištěno v Československu

Ref. č. I D - 061 č — 5010

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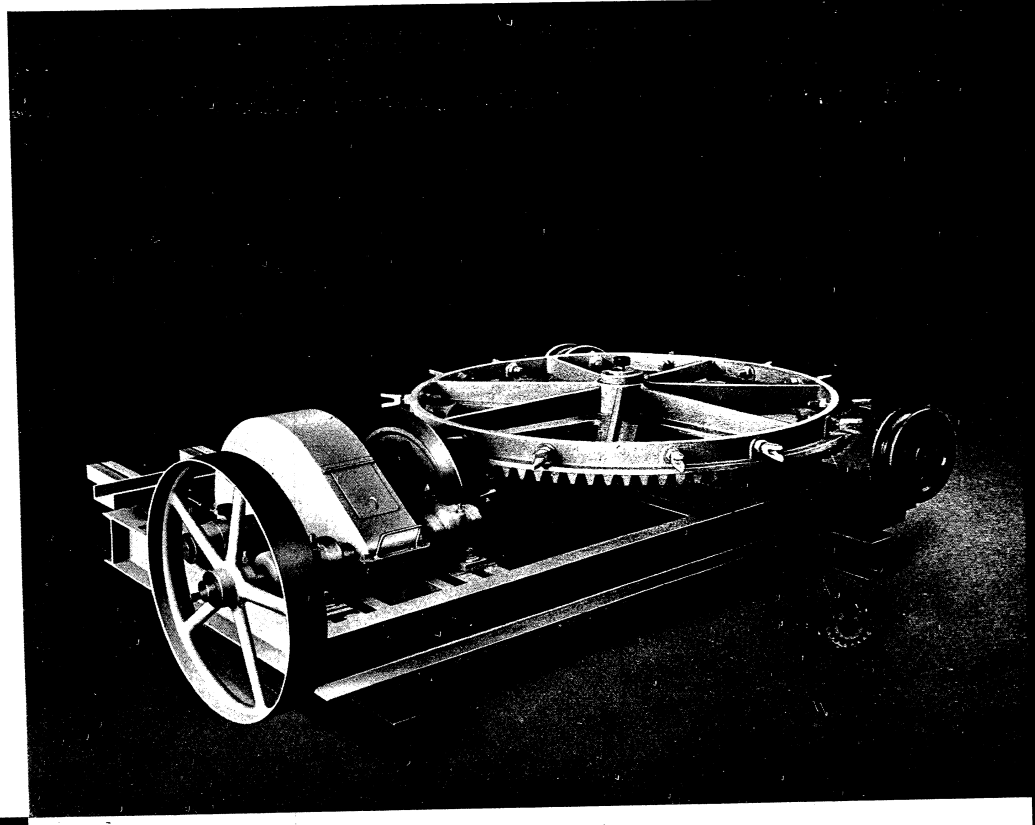

Při velkých výkonech a větších vzdálenostech hliníku od lisovny se dopravuje hlína dvoukolejovým řetězovým výtahem. Tento výtah sestává z pohonné stanice umístěné v budově lisovny a ze stanice vratné, která je postavena pokud možno nejblíže k místu těžení hlíny.

Pohonná stanice je samostatný celek, skládající se z nosné svařované konstrukce a z poháněcího zařízení, na ní namontovaného. Hlavní částí tohoto zařízení je tažné řetězové kolo, naklínované na svislém hřídeli a poháněné od elektromotoru klínovými řemeny a převodem čelních a kuželových kol s frézovanými zuby. Proti samovolnému zpětnému chodu, který by mohl nastati při náhodném přerušení proudu, je poháněcí zařízení zajištěno třecí západkou. Pohonná stanice může býti též opatřena pevnou a volnou řemenicí s přesouvadlem řemene v případě, že by měl býti výtah poháněn od transmise.

Vratná stanice je v podstatě volně otočné řetězové kolo, uložené v litinovém stojanu na svislém hřídeli.

Obě stanice jsou spojeny nekonečným článkovým řetězem, vedeným přes obě řetězová kola a podpěrné kladky.

Není-li dráha v půdorysu přímá, musí se v místě ohybu upraviti další vodicí kladky, kterými se umožní změna směru obou větví řetězu.

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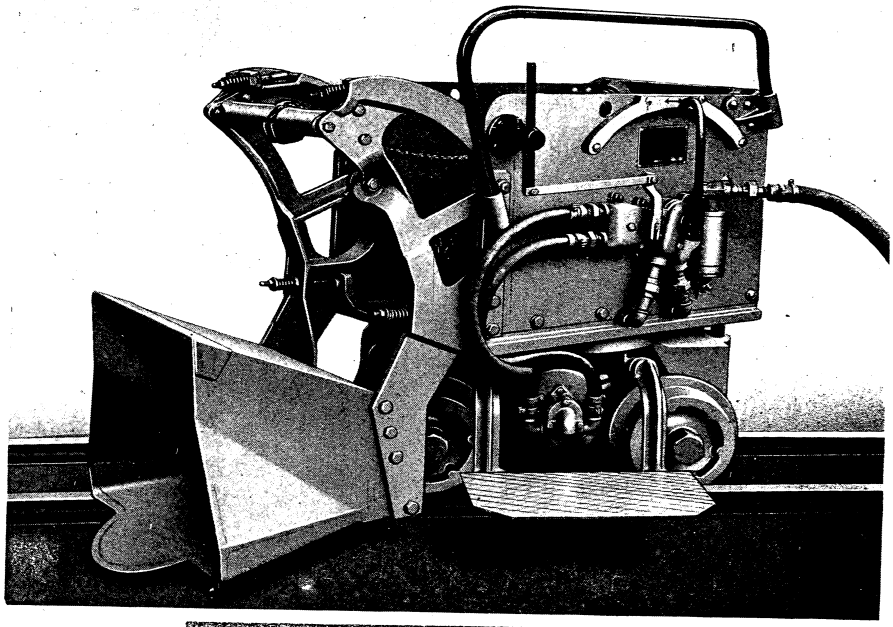

## SPECIFICATION

| | | |
|---|---|---|
| Output of loader per hour | 40 cu. metres | 1400 cu. ft |
| Capacity of shovel | 0.12 cu. metres | 4.24 cu. ft. |
| Track, as specified in the order | 435 to 650 mm | 1'5" to 2'1" |
| Wheelbase | 700 mm | 2'3½" |
| Overall width of loader | 850 mm | 2'9½" |
| Maximum length of loader at height of 2050 mm (6'8¾") | 1150 mm | 3'9¼" |
| Maximum height of loader at length of 1855 mm (6'1") | 1250 mm | 4'1¼" |
| Maximum working range of shovel, to one side | 1000 mm | 3'3½" |
| Working pressure | 5 atms | 70 psi |
| Diameter of air supply hose, according to length and pressure | 25 to 35 mm | 1" to 1⅜" |
| Consumption of free air for one engine per hour | 320 cu. metres | 11300 cu. ft. |
| Weight of loader | 2200 kg | 4850 lbs |
| Drive by compressed air engines | 2 radial engines | 6 HP each |
| Maximum travelling speed | 4 km p. h. | 2.4 m. p. h. |
| Duration of one working cycle | 6 seconds | |

In view of the fact that every mining plant uses its own type of lock, the latter is not supplied by us.

**STROJEXPORT** — PRAHA — CZECHOSLOVAKIA

ČOK 52559a - 5501

Printed in Czechoslovakia

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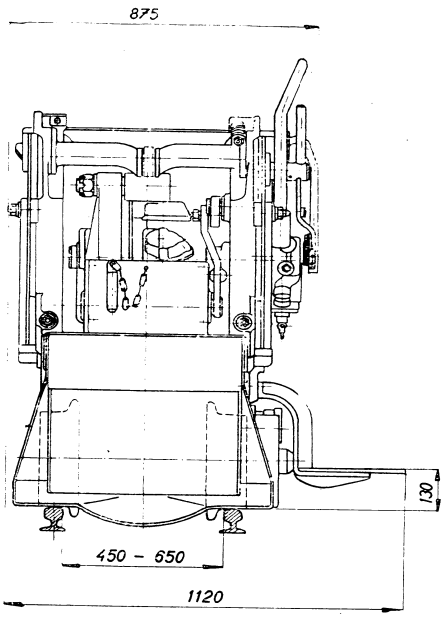


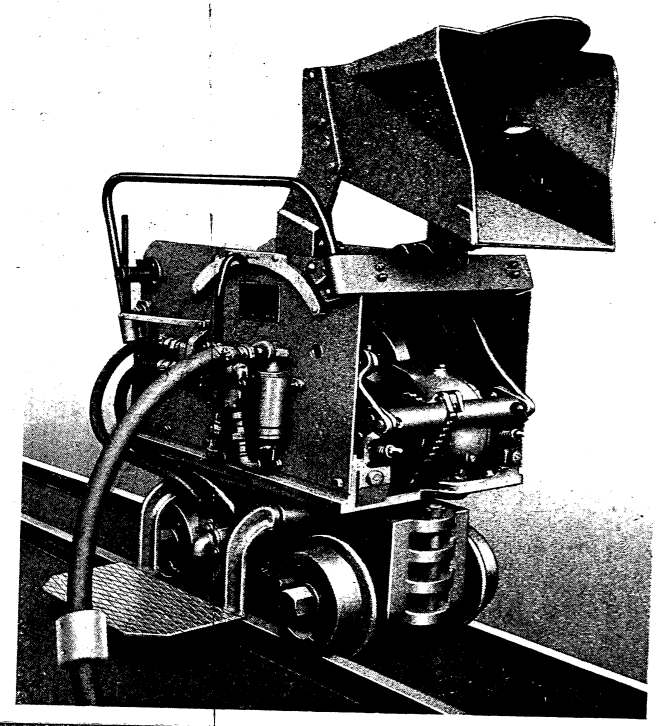

## TECHNICAL DESCRIPTION

The Type NL 12 V Shovel Loader is used to advantage for preparatory works in mines, its design and method of loading fully meeting the requirement of the confined space encountered in mines. The mineral handled may be of different kind, either in grain or lumps of 30×30×30 cm (12×12×12 in.) size.

The efficiency of loading consists in the utilization of the weight of the loader for driving the shovel into the mineral which has not been sufficiently loosened by explosives.

The type NL 12 V shovel loader is built up of three main parts:

- 1 The undercarriage box with a compressed air engine for driving all four travelling wheels.
- 2 The upper revolving box with a compressed air engine for driving the loading mechanism.
- 3 The loading mechanism with the shovel and the rolling arms with guide steel ropes.

Having taken a start on a track of less than 50 cm (20 in.) length, the loader drives the shovel in a scooping position into the mineral. Filling the shovel is facilitated by its simultaneous slow raising. The upward movement of the shovel is accelerated until the maximum speed is reached, at which the mineral is being unloaded into a truck attached to the rear of the loader. Simultaneously with the tilting operation the loader returns to its ramming position.

By proper harmonization of all these movements an output of up to 40 tons of loaded mineral per hour can be attained.

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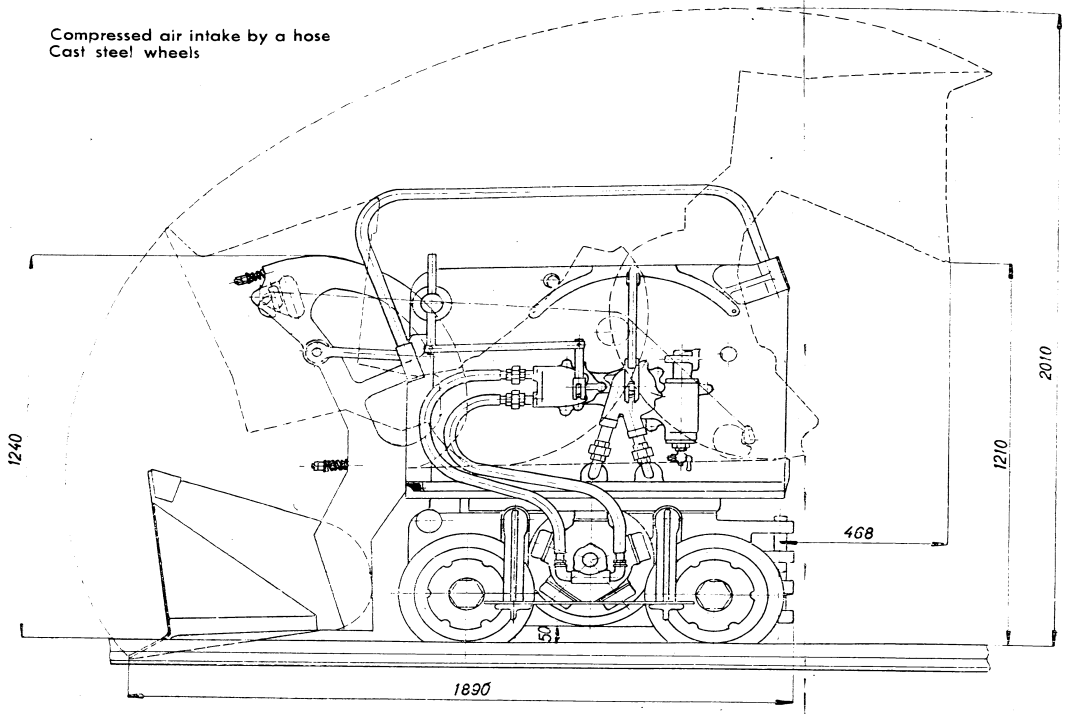
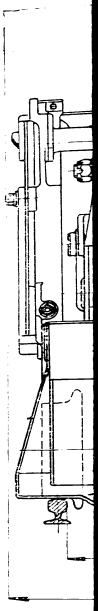
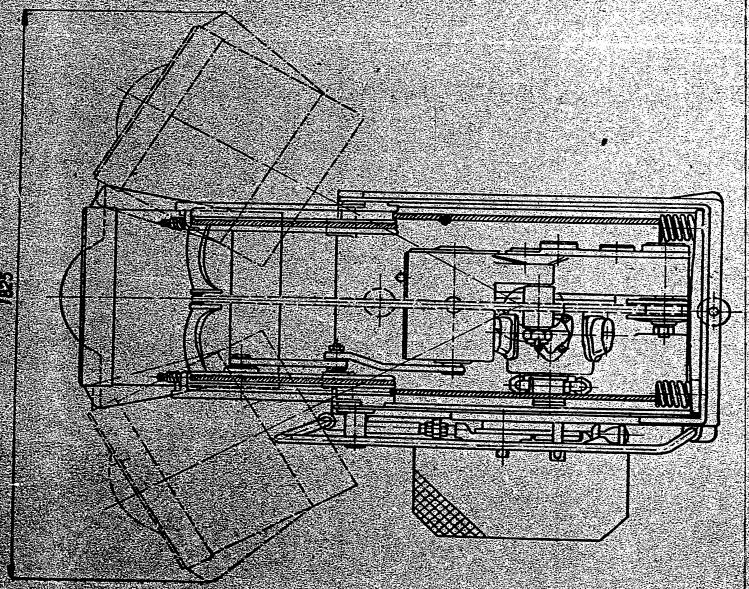
Compressed air intake by a hose
Cast steel wheels



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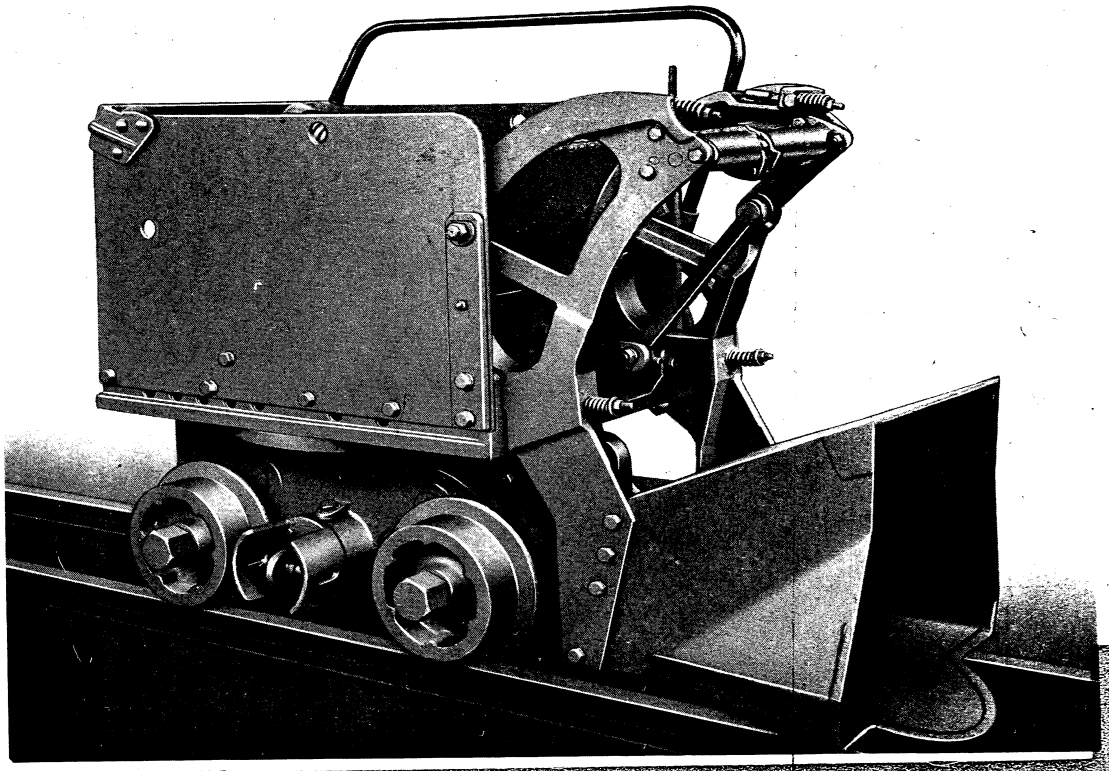
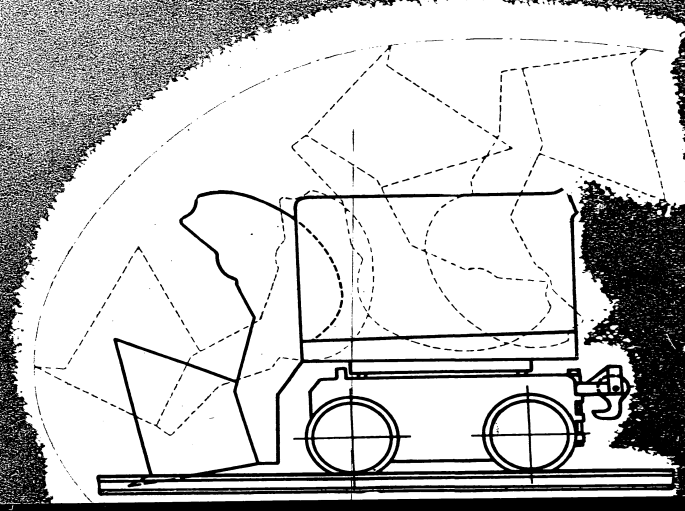


# TYPE NL12V SHOVEL LOADER



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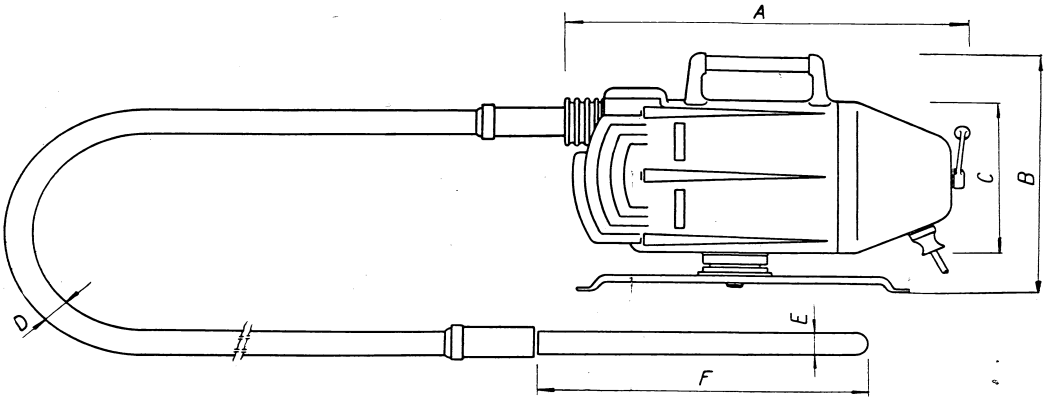


L = length of flexible shaft.

| Type | A | B | C | D | E | F | G | L |
|---|---|---|---|---|---|---|---|---|
| IT 1135 mm | 450 | 300 | 200 | 45 | 45 | 450 | | 4000 |
| inches | 17 3/4" | 11 3/4" | 7 7/8" | 1 3/4" | 1 3/4" | 17 3/4" | | 13'1" |

**The surface of the vibrator including the protective hose and vibrating head must be kept clean. To ensure the best possible performance of the machine, individual parts should be replaced in time when worn. This can also be done by interchanging parts of machines of the same type.**

**The machine is moved about fully assembled at its place of work by hand, i. e. with the protective hose with the flexible shaft and the vibrating head attached. To move the machine to another site it is, as a rule, divided into two parts, i. e. the electric motor and the protective hose with the flexible shaft and vibrating head. In this case care must be taken to stop impurities from entering the protective hose through the dismantled end fitting.**

**When ordering the voltage must be stated for which the vibrator is to be connected as well as any requirement the customer may have concerning the length of the connecting cable. Unless this is specified in the order, the machine will be supplied connected for 380 Volts, 3 phase, with a cable 5 metres (19'8") long.**

**STROJEXPORT**

**PRAHA - CZECHOSLOVAKIA**

ČOK 52451 a - 5410

Printed in Czechoslovakia

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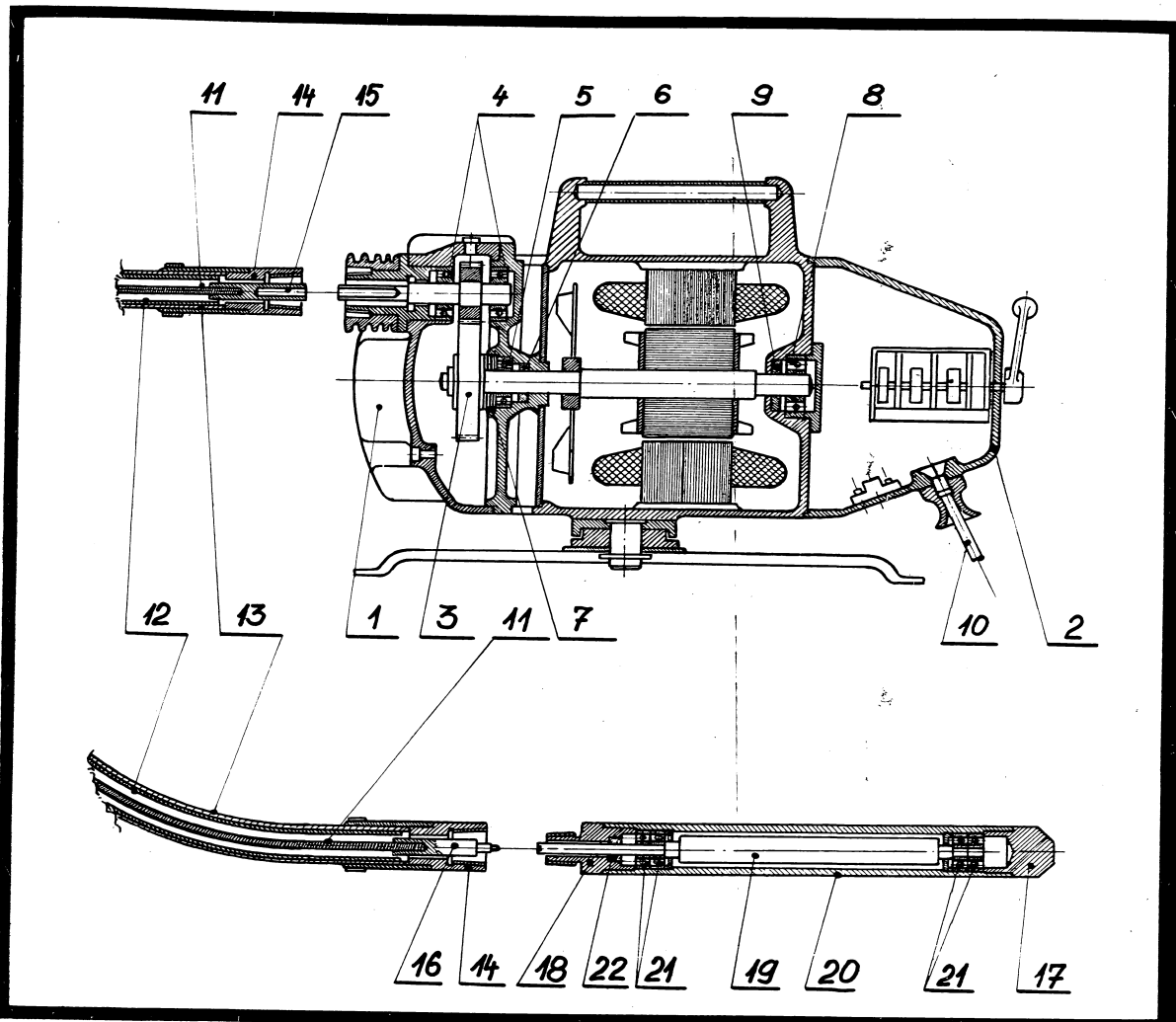


1 - Gear Box
2 - Switch Cover
3 - Large Gear Wheel with Uni-Directional Coupling
4 - Ball Bearing 6203
5 - Ball Bearing 6205
6 - GUFERO Sealing Ring 20/35 mm
7 - Circlip I 52
8 - Ball Bearing 6204
9 - GUFERO Sealing Ring 24/47 mm
10 - Type HSS Cable, 4×2.5 sq. mm Cu, 10 metres long
11 - Flexible Shaft Core - OH 12, for clockwise rotation
12 - Type HP2 17/24 Armoured Protective Hose with Sliding Coil
13 - Protective Rubber Hose
14 - Hose Fitting
15 - End Fitting of Shaft - Motor End
16 - End Fitting of Shaft, Threaded
17 - End Piece of Head
18 - Threaded Cap of Head
19 - Eccentric
20 - Shell
21 - Ball Bearing 6203
22 - GUFERO Sealing Ring 17/28 mm

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gear is equipped with a uni-directional coupling which ensures the required direction of rotation. The flexible shaft is built for clockwise rotation. The machine has to be carried about frequently in operation and the motor housing is made of light metal for easier handling.

Easy swivelling of the motor on the skid limits the occurrence of bends in the flexible shaft when the vibrating head is operated in various working positions from the same position of the motor. The electric motor is provided with a reversing switch and a cable 5 metres (19'8") long. The motor can be made to run in its correct direction of rotation by changing over the reversing switch. By doing so the clutch is engaged and the flexible shaft and vibrating head made to operate.

The flexible shaft, which is built for clockwise rotation and enclosed in a protective hose, is provided with end fittings at its ends. The end fitting connecting the shaft to the electric motor is of the sliding type, the end which fits on the vibrating head end is provided with a thread. The protective hose is connected both to the motor and to the vibrating head by fittings with tapered threads and its design as well as its connections are watertight. The vibrating head, which is easy to exchange, has a diameter of 45 mm ($1^{3}/_{4}$"). Its dimensions make this type of immersion vibrator suitable for densifying both plain and reinforced concrete.

## OPERATION AND MAINTENANCE

The machine is supplied in a dismantled condition in the following two parts: the electric motor with the gear box and the protective hose with the flexible shaft and vibrating head. The electric motor is supplied ready for immediate operation, connected for 220 or 380 Volts, 3 phase in accordance with the voltage stated in the order. It should be connected to the power mains on the working site by means of the connecting cable. Each vibrator should be provided with protection against defects and overload in its connection to the mains. The neutral conductor must be earthed. The connecting cable should be protected against damage. When the flexible shaft is connected to the output end of the gear box of the motor by means of the sliding type fitting and the protective hose to the threaded fitting of the gear box, the machine is ready for operation. The electric motor is started by switching on the reversing switch. If the vibrating head remains at rest the motor should be started in the correct direction of rotation by changing over the reversing switch. The uni-directional coupling then automatically connects the flexible shaft and starts the vibrating head. The immersion of the vibrating head into the concrete being vibrated and its removal from it is done only with the vibrator running. Care must be taken in operation not to allow the protective hose to form bends with a small radius or loops as this might reduce its life. The depth of immersion of the vibrating head into the concrete being vibrated is determined by its length. The mutual distance of individual points of immersion is determined by the intensity of vibration produced with regard to the suitability for treatment of the concrete mixture used.

The gear box of the electric motor is filled with high grade gear oil the correct quantity of which is indicated by the oil level check screw which is removed when the gear box is being filled. The gear box is filled through a hole located in the top part of the gear box which is closed by an air vent screw. The oil is changed after approximately every 100 hours of operation, the period depending on the quality of the oil.

The flexible shaft is covered on its entire surface with a layer of high grade high melting point grease and inserted into the protective hose which contains a sliding steel coil. On completion of every shift and in cases when the protective hose heats considerably, the old grease should be removed and the flexible shaft lubricated afresh. To do so the flexible shaft and connecting hose, having been detached from the motor, are also detached from the vibrating head and the flexible shaft is taken out of the protective hose. A piece of cotton waste is then pulled through the protective hose to remove the old grease. The flexible shaft is cleaned, pulled through a handful of grease and reinserted in the protective hose, which makes it ready for further operation.

After every 200 hours of operation the ball bearings of the vibrating head should be cleaned and packed with fresh grease. This maintenance operation can be carried out on the bearings when the bottom end piece and the top threaded cap of the vibrating head are unscrewed by means of which both ends of the bearings are uncovered in which the eccentric is mounted. While this operation is being carried out the thickness of the wall of the vibrating head shell (steel tube) should be checked and, if necessary, replaced in time to prevent it from wearing through in operation. By doing so the vibrating head is prevented from being completely destroyed by concrete which would find its way inside and also the risk of possible damage to the electric motor is avoided.

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28/
7 - Cl
8 - Ba

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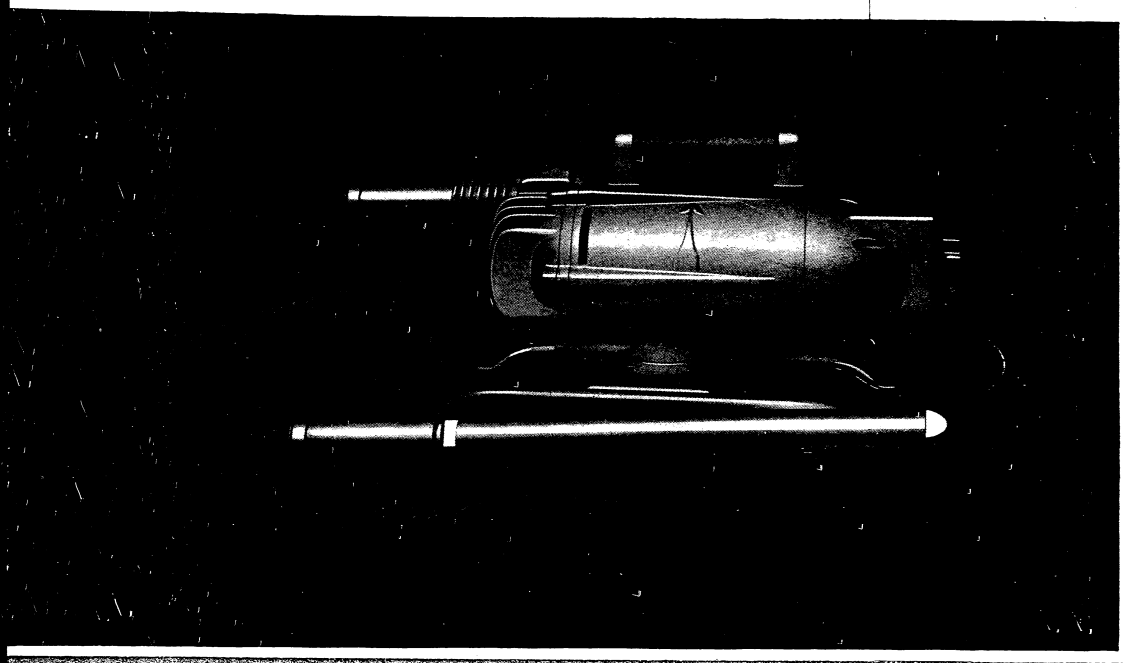

# TYPE IT 1135 IMMERSION VIBRATOR

| | | | |
|---|---|---|---|
| Output of electric motor | 1.1 kW | Dimensions of vibrating head | 45 mm dia x 450 mm (1¾" dia x 17¾") |
| Voltage | 220/380 Volts, 3 phase | | |
| Frequency | 50 cycles | Length of flexible shaft (protective hose) | 4000 mm (13'1") |
| Centrifugal force | 500 kg (1100 lbs) | Total weight of machine | 47 kg (104 lbs) |
| Frequency of vibration | 8600 per min. | Weight to be handled | 10 kg (22 lbs) |

The machine is intended for vibrating plain as well as reinforced concrete. The favourable ratio between its power and own weight makes it suitable for use on small as well as large masses of concrete.

## DESIGN

The vibrator is designed for continuous operation and the motor is sealed against impurities in view of the localities in which it has to operate. The connection of the vibrating head is watertight. The flexible shaft is protected against damage by rotation in the incorrect direction by an automatic uni-directional coupling built into the gear of the electric motor. The machine is equipped with a reversing switch for easy reversing of the electric motor. The cable is of the HSS type, 4 x 2.5 mm², with an earthing conductor. The type HSS cable is provided with a sealing rubber hose at the point where it enters the electric motor. The surface of the machine is ground smooth and finished with one coat of nitro-enamel paint.

## DESCRIPTION

The vibrator consists of three fundamental interchangeable parts: the electric motor with the gear box, the flexible shaft in the protective hose with the necessary end fittings and the vibrating head.
The electric motor is cooled by ventilating ducts and equiped with a gear running in an oil bath. The gear is enclosed in a gear box which is surface cooled by means of cooling fins. The motor is mounted on a swivel on a skid which serves as a base for the machine. The motor housing is provided with a carrying handle. The

**IT**

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## SPECIAL DESIGNS:

**JACKETED TROUGH SHELLS** may be supplied for each machine to permit heating by steam or warm water, or cooling by water.

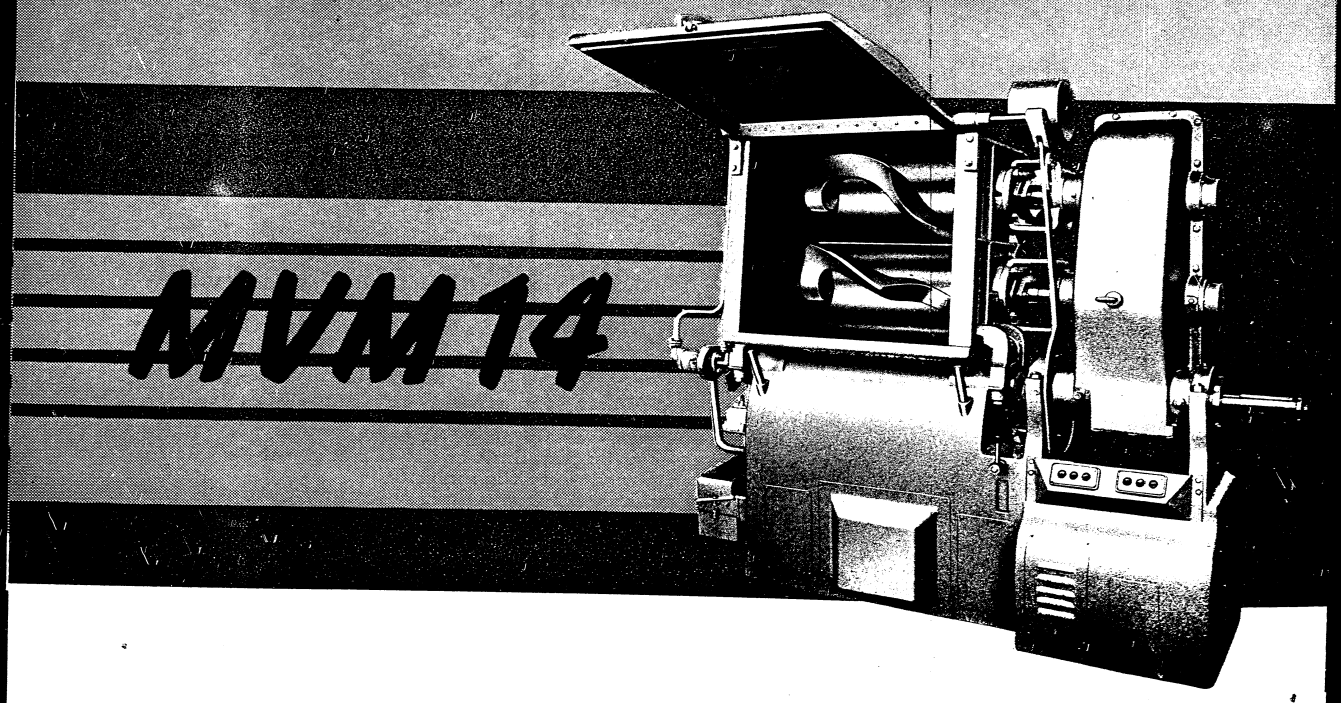
**TWO-END DRIVE OF BLADES.** For processing very tough substances we supply machines with both-side drives.

**LINING** of the trough and plating of the blades with corrosion resisting material may be provided for any type of machine.

**RENEWABLE TROUGH LINING AND BLADE SHOES** for processing abrasive materials may be supplied to prevent premature wear and to lengthen the life of the machine.

**EXPLOSION-PROOF DESIGN.** In this case the V-belt is replaced by an additional gear box and the connection of the machine with the electric motor is then made by flexible couplings.

| Type | Trough Capacity in lit/galls | | Dimensions mm/inches | | | Electric Motor kW | | Weight kgs/lbs | | Shipping space m³/cu ft | Code-word |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | Total | Useful | Height | Width | Depth | Drive | Tipping | Net | Gross | | |
| MV 6 | 32/7,1 | 25/5,5 | 1400/55 | 1125/44 1/4 | 700/27 9/16 | 1,5 | — | 360/795 | 500/1100 | 1,25/44 | MIMA |
| MV 10 | 125/27,5 | 100/22 | 1500/59 | 1450/57 | 1050/41 5/16 | 4 | 0,55 | 1100/2430 | 1350/2990 | 1,8/64 | MOSA |
| MV 14 | 500/110 | 400/88 | 2000/79 | 2250/88 9/16 | 1350/53 1/8 | 8 | 1,1 | 2080/4600 | 2530/5500 | 7/250 | META |
| MVM 13 | 400/88 | 315/70 | 1450/57 3/16 | 2250/88 9/16 | 2000/79 | 8 | 1,5 | 2200/4860 | 2600/5750 | 6,3/224 | MEHAL |




Printed in Czechoslovakia. Unie, Praha

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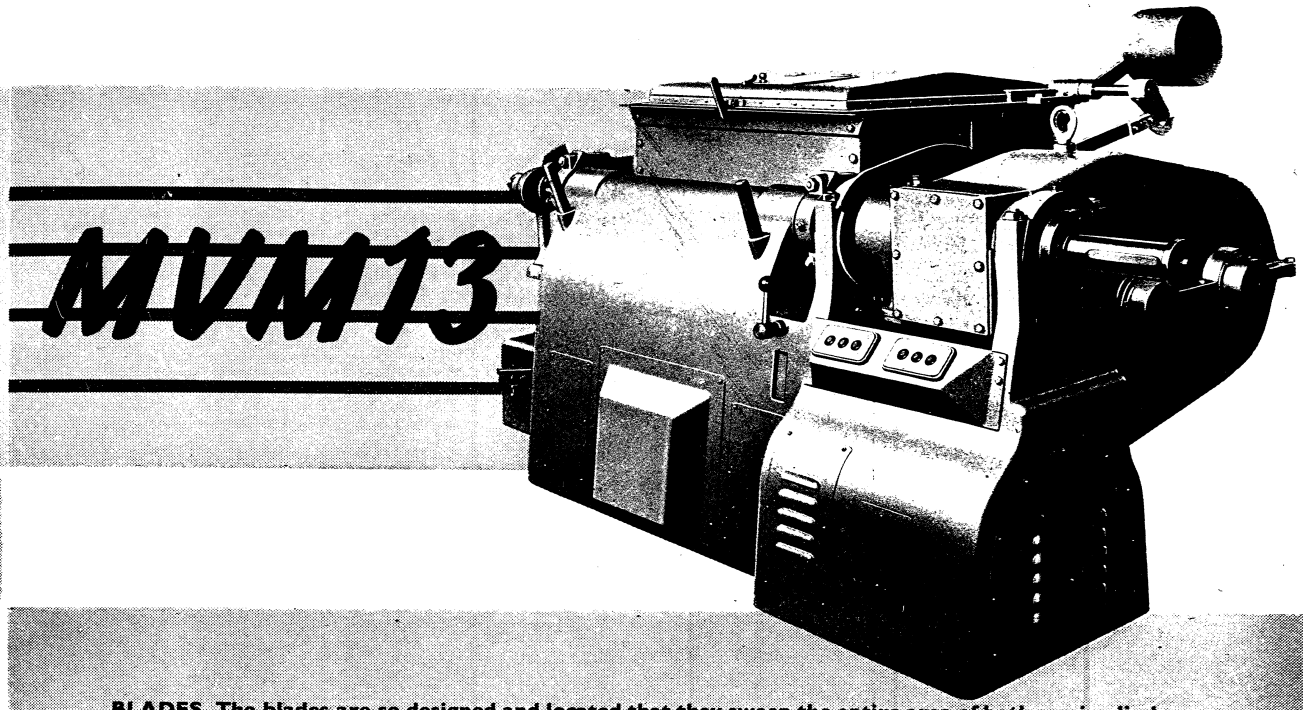
# MVM13



**BLADES.** The blades are so designed and located that they sweep the entire area of both semi-cylinders on each revolution. The blades revolving towards each other at unequal speed ratio, pass the material back and forth from one blade to the other with the result of a thorough mixing effect. The clearance between the blades and trough is made as close as possible. Normally we supply "Sigma" blades, but also "Zeta" and other types of blades may be provided, this being dependent on the properties of the substance treated. The blades run in ample-size plain bearings which are in the trough ends sealed by means of packing glands in exchangeable stuffing boxes preventing penetration of the processed substance from the trough.

The machines are driven by individual electric motors, housed in the machine stand, by means of V-belts and two pullyes. The gear box is, in the majority of cases, made of cast iron and its gears run in an oil bath. In case of smaller units the gears are provided with a sheet steel cover and lubricated with a mixture of grease and oil. The countershaft runs in ball bearings. Both pairs of gears are of ample size and carefully machined to ensure smooth running.

**SAFETY** against injury is assured by limit switches which stop the machine immediately if the cover is opened more than consistent with the safety of the operator.

**ELECTRICAL EQUIPMENT** comprises a contactor combination, limit switches and signal devices so that the client will simply connect the contactor combination to the mains.

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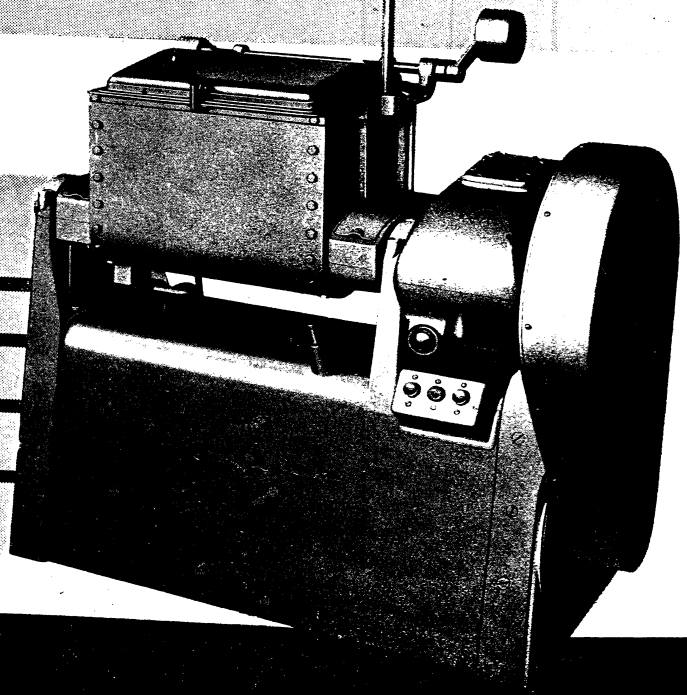
# MV, MVM

**APPLICATION.** The twin-blade mixing machines are used for mixing and kneading of substances in paste and powder form. They find a manifold employment in numerous industrial branches, e. g. in the manufacture of plastics, putty, accumulator pastes, chocolate and generally in the foodstuff and chemical industries.

**DESIGN.** The design of our types of mixing machines is the outcome of constructional development carried out by leading engineering works at home and abroad. Particular care has been devoted to simplicity in design and to operating efficiency of the machines, as well as to their general appearance. We are steadily continuing with the development work in this line.

**DESCRIPTION.** The essential components of the machine are the trough and the blades arranged on an enclosed stand. Tilting of the trough is done by an electric motor in conjunction with a gear box and a worm. In case of MV-type machines the tilting axle is in the axle of the front blade. The MVM-type machines have the tilting axle arranged outside the blade axle close to the top rim of the trough which is more advantageous when charging the trough as the top rim is lower than in the MV-type machines. Tilting of the trough in MVM-type machines is effected hydraulically. The MV-6-type is tilted by a hand lever.

**TROUGH.** The trough consists of a prismatic top part and a bottom part having the shape of two semi-cylinders. The trough ends are of cast iron and fit closely to a sheet steel shell. According to the purpose and application of the machine the trough shell is either made of sheet steel or cast iron. The trough is closed by a standard sheet steel cover.



MV6

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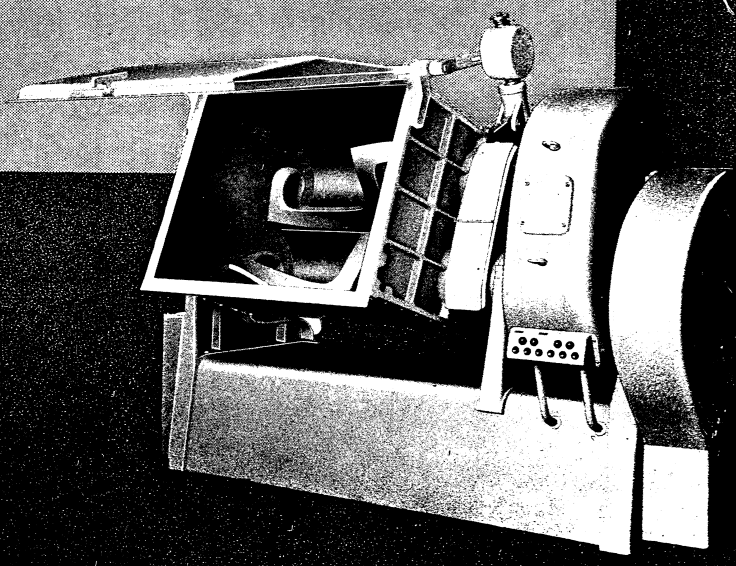
# MV, MVM

## MIXING AND KNEADING MACHINES



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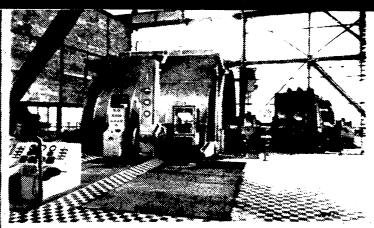
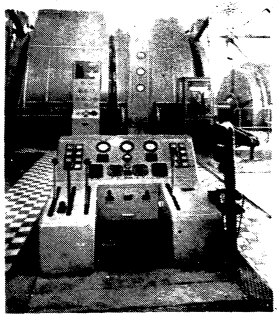
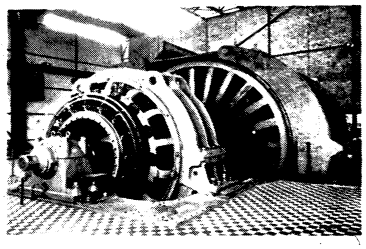
# ČKD

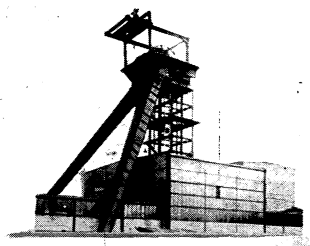
**designs, produces and / or provides the assembly of following machines, structures, installations and parts thereof:**

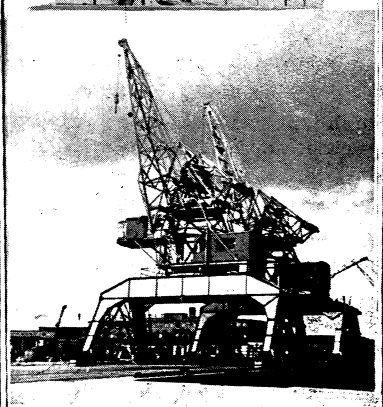
Winding machines
Headframes
Pit cages
Friction gear and auxiliary hoisting winches
Cages combined with skips and skips
Rope pulleys
Tub handling arrangements at both pithead and haulage levels
Sorting plants for dry sorting of coal
Depth bunkers
Mullock tip installations
Belt conveyors
Chain conveyors
Bridge cranes
Semi-gantry cranes
Gantry cranes
Gantry cranes for barrages
Hydraulic slewing cranes (lorry mounted) HSC 4
PRESTO slewing cranes
Tube design gantry cranes
Overhead grab trolleys
Steel weir structures
Machinery for water engineering structures
Spare parts for all machines and installations











**STROJEXPORT**

**PRAHA - CZECHOSLOVAKIA**

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## Stability of the crane

(at max. load and max. radius)

| Radius | Load | Stability | |
|---|---|---|---|
| | | related to longitudinal undercarriage axis | related to transversal undercarriage axis |
| 6 m | 4.000 kgs | 1,7 | 1,2 |

The stability is secured by extending 4 supports mounted on the crane chassis and by mounting a counterweigt filled with sand or suchlike material weighing 800 to 1.000 kgs. The unenvenness of the ground can be compensated by means of screw jacks at the end of the supports thereby setting the crane to a horizontal position.

## Overload prevention

The hydraulic system of the crane is fitted with so called overload valves for all hydraulic circuits of hoisting, luffing and slewing; should overloading or improper manipulation take place the mechanism in question will be put out of action automatically.

## Oil for the hydraulic system - sorts and uses

In order to ensure a reliable a performance of the crane under any circumstances it is necessary to use in different cases such oils as recommended by following table:

| Climate | Sort of oil | Oil characteristics |
|---|---|---|
| mild | low congealing oil L | (9° E*) 20° C to — 30° C |
| subtropical | low congealing oil PT | (3—4° E) 50° C to — 25° C |
| tropical | car oil Z | (5,5° E) 50° C to — 25° C |
| polar | low congealing oil VL | (5° E) 20° C to — 40° C |

E* viscosity Engler.

## Lighting equipment

A rotary and tilting searchlight is mounted on the crane driver's cab. It can be controlled from within thus enabling the illumination of the work site and the control of the load at night.

A rear searchlight mounted on the rear side of the crane and controlled from the lorry driver's cab makes crane movements easy even at an impaired visibility.

## Crane controls

The hydraulic drive enables a very simple and easy control of the crane. All controls and necessary devices are arranged in crane driver's cab from which there is a good overall view of the work site. The cab is designed to give the driver the possible maximum of comfort and to protect him from disagreable weather effects. All glass panels are shockproof.

HSC Cranes are made in series. All necessary equipment and a set of spare parts are delivered with each crane; apart from it a service for spare parts requirements is in our works at customers' disposal.

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# Mobile Hydraulic Slewing Crane HSC 4

The Mobile Hydraulic Slewing Crane HSC 4 is intended for load handling in all lines of industry and building. It can be also used with equal succes in railway transport for loading and unloading operations; its versatility comes to value in assembly work of any kind as loads up to 4.000 kgs can be hoisted.

Large field of application, mobility, simple manipulation and attendance - these are the main advantages of this type of crane.

The hoisting mechanism of the crane has a hydraulic drive. The hydraulic system proper consists of an efficient double gear pump, distributory and safety valves, two hydraulic cylinders, hydraulic drive for the slewing motion, high pressure piping and two mutually interconnected oil tanks.

## Technical data of the HSC 4 crane

Basic capacity characteristic 24 tons meters.

## Maximum carrying capacities and hoisting speeds

| Hoisting | Normal jib (6 m) max. load 4.000 kgs | Jib with extension (8,5 m) max. load 2.500 kgs | Time of a 360° revolution |
|---|---|---|---|
| Hook hoisting | H 3 m min. | H = 3 m min. | |
| Jib hoisting (luffing) | J = 4 m min. | J = 5,6 m min. | t = 70 sec. |
| Both movements together | 7 m min. | 8,6 m min. | |

## Undercarriage (Chassis)

The Hydraulic Crane is mounted on a lorry undercarriage, the reputed Tatra 111, of 10 tons capacity, with air- cooled 12 cylinder Diesel engine of 180 HP output. This undercarriage enables the crane to travel even on a rough ground; the travelling speed can attain 60 kilometers an hour.

## Maximum dimensions of the crane

| | |
|---|---|
| Total lenght . . . . . | 7.800 mm |
| total height . . . . . | 3.450 mm |
| total width . . . . . | 2.500 mm |

Weight of the crane including Tatra 111 udercarriage 11.500 kgs.

## Crane engine

The hydraulic double gear pump is driven by Tatra 14/52 petrol engine. This is a air cooled 4 cylinder engine, OHV type, giving an output of 27 HP at 2.500 r.p.m. Fuel consumption (petrol) in a continuous operation at maximum load equals 10 liters per hour.

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CZECHOSLOVAKIA

# MOBILE HYDRAULIC SLEWING CRANE HSC 4

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# TECHNICAL DATA OF THE "ŠKODA Mb 2" UNIVERSAL EXCAVATOR

| GENERAL TECHNICAL DATA | | standard | special |
|---|---|---|---|
| Diesel Engine output, max. | HP | 90/108 | |
| Engine speed at this output | approx. | 750 r. p. m. | |
| Revolving speed of excavator | | 4.16 r. p. m. | |
| Travelling speed (2 speeds) | km/miles p. h. | 0.87/0.55 or 2,17/1,35 | |
| Width of crawler belt | mm/inch. | 680/26 3/4" | |
| Overall width of excavator | mm/ft., inch. | 2990/9'10" | |
| Overall height during travel | mm/ft., inch. | 4000/13'1" | |
| Length of lower frame | mm/ft., inch. | 3824/11'6" | |
| Height from ground to balast box | mm/ft., inch. | 1065/3'6" | |
| Turning radius of rear cabin part | mm/ft., inch. | 3530/11'2" | |
| Distance from excavator centre to boom pin | mm/ft., inch. | 1325/4'4" | |
| Clearance between ground and boom pin | mm/ft., inch. | 1426/4'8" | |
| Diameter of hoisting drums | mm/inch. | 550/21 5/8" | |
| Average pressure of crawler belts during travel | approx. | 1 kg p. sq. cm/14.22 lbs p. sq. inch. | |
| **SHOVEL EXCAVATOR** | | | |
| Max. thrust of shovel | kg/lbs | 14,300/31,600 | 18,200/40,200 |
| Shovel capacity | cu. m/cu. ft. | 1/35 | 1.45/51 |
| Diameter of steel ropes hoisting - thrusting | mm/inch. | 24/24 15/16/15/16 | 24/24 15/16 15/16 |
| Speed of ropes | approx. m/ft. p. min. | 60/183 | 47/143 |
| Constructional weight | approx. kg/lbs | 34.800/77.000 | |
| **GRAB EXCAVATOR** | | | |
| Length of boom | mm/ft., inch. | 10,900/35'9" | |
| Grab capacity | cu. m/cu. ft. | 0.85/30 | |
| Diameter of steel ropes: hoisting - flap opening | mm/inch. | 22/22 7/8 7/8 | |
| Speed of ropes | approx. m/ft. p. min. | 60/183 | |
| Constructional weight | approx. kg/lbs | 32.300/71.200 | |
| **DRAGLINE EXCAVATOR** | | | |
| Length of boom | mm/ft., inch. | 10,900/35'9" | 14,10/46'4" |
| Bucket capacity | cu. m/cu. ft. | 1.05/37 | 0,42/15, 0,75/27 |
| Diameter of ropes: hoisting - dragging | mm/inch. | 22/22 7/8 7/8 | |
| Speed of ropes | approx. m/ft. p. min. | 60/183 | |
| Constructional weight | approx. kg/lbs | 31.400/69.400 | |
| **CRANE EXCAVATOR** | | | |
| Length of boom | mm/ft. inch. | 10,900/35'9" | 14,100/46'4" |
| Max. luffing radius | mm/ft. inch. | 11,500/37'9" | |
| Carrying capacity at max. working radius | kg/lbs | 3,150/6,970 | |
| Min. working radius | mm/ft. inch. | 5,500/18'1" | |
| Carrying capacity at min. working radius | kg/lbs | 8,350/18,420 | |
| Constructional weight | approx. kg/lbs | 32,300/71,200 | 32,800/72,400 |
| **TRENCH HOE EXCAVATOR** | | | |
| Width of shovel | mm/ft., inch. | 1,100/3'7" | |
| Shovel capacity | cu. m/cu. ft. | 0,8/28 | |
| Diameter of steel ropes - dumping | mm/inch. | 22/22 7/8/7/8 | |
| Speed of steel ropes - dumping | mm/inch. | 30/60/1 3/16/2 5/8 | |
| Constructional weight | approx. kg/lbs | 34.800/77.000 | |

**STROJEXPORT** PRAHA - CZECHOSLOVAKIA

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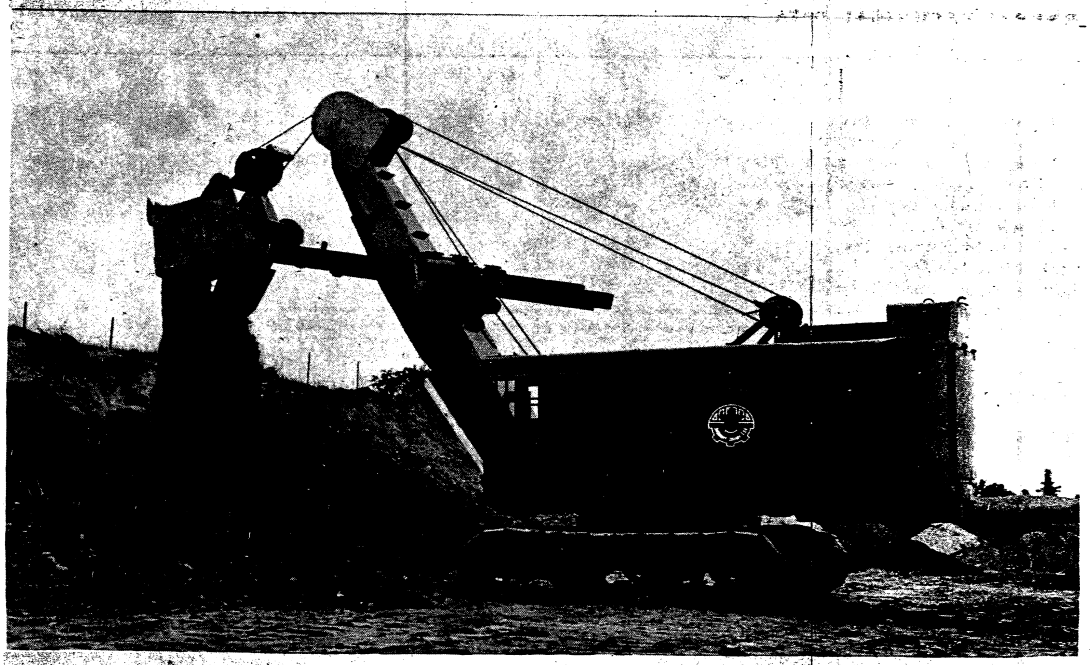
# THE "ŠKODA Mb 2" UNIVERSAL EXCAVATOR



**THE "ŠKODA Mb 2" UNIVERSAL EXCAVATOR represents an approved design suitable for heavy operation. The basic excavator can be easily fitted with any additional equipment such as trench-hoe, grab, crane or dragline, without the necessity of dismantling the mechanical components of the excavator proper. All movements of the excavator are controlled from the operator's stand.**

**The Škoda Diesel Engine is a four-cylinder, four-stroke unit of vertical design without compressor started by compressed air. Rated output of the engine is 90 HP, maximum 108 HP, rated speed 750 r.p.m.**

**On special request we supply electrical equipment 380 V or 500 V.**

**The rail transport of this excavator is very simple, since no major dismantling is necessary, in fact the excavator can be driven under its own propelling power from an end or side loading ramp onto a wagon. Some components, such as a part of the cabin roof as well as the fuel and cooling water tanks must be removed and the pulley bracket tilted. For rail transport a plat top wagon of 40 tons carrying capacity should be used. Owing to its easy and speedy transport the excavator may be used even for short period jobs without any appreciable loss of time.**

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5. **Governor.**

The speed governor is designed for 1/200 irregularity of run at 190 r. p. m., is tested in the manufacturing plant and the adjustment of springs must not be changed unless absolutely necessary.

The governor is fitted with a hand operated speed changing device.

By turning the hand wheel clockwise (viewed from above), the number of revolutions is reduced. By turning the wheel counter-clockwise, the number of revolutions is increased.

If the generator is working in parallel with other generators for a common network, the speed changing device regulates also the load of the generator, i. e. by turning the manual wheel clockwise, the generator load is reduced. By a counter-clockwise rotation, the generator load is increased.

6. **Air pump.**

The air pump comprises 2 feed pump plungers (in its cover) and 1 oil pump for circulating lubrication (on the outer side). The air pump piston is driven by the crankshaft by means of a connecting rod, which is fastened to the eccentric stirrup mounted to the crankshaft.

7. **Feeding pumps.**

2 feeding pumps are fitted in the upper cover of the air pump. The feed pump pistons are suspended on the air pump piston. Permissible suction head of the feed pumps is maximum 5 metres for feedwater temperature 20° C and maximum 4 metres for feedwater temperature 30° C.

The suction of the feedwater and delivery to the boiler is performed by a suction pipe with strainer to the tank and a delivery pipe to the feedwater heater.

The steam injector on the boiler acts as standby feed pump. From one side, it is connected to the steam boiler (by a steam valve), from the other side, it is connected with the distribution valve on the boiler by a bent tube. It is fitted with a suction

**TECHNOEXPORT**

FOREIGN TRADE CORPORATION

FOR EXPORT OF COMPLETE INDUSTRIAL PLANTS

PRAHA 2, VÁCLAVSKÉ NÁM. 56, CZECHOSLOVAKIA

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**b** **The Withdrawable Fire Box**

The fire box, which is bricked in with refractory bricks, has two doors and is arranged for withdrawal to afford easy and quick access to the boiler.

**c** **The Synchronous Three Phase Generator**

The generator is fitted on a common frame with the exciter and the driven V-belt pulley. This affords easy and quick assembling.
A reliable and practical oil distributor forms part of the generator.

**d** **Switchboard**

The free standing sheet steel panel switchboard consists of two panels 1000 mm wide. The overall length is 2135 mm, the height 2250 mm and the depth 800 mm.
The switchboard serves for the regulation of the generator and the electric power distribution. Panel 1 is equipped as a generator panel and fitted with measuring instruments and a shunt regulator. Panel 2 is equipped with two 200 Amp feeders four 100 Amp feeders with toggle switches and two 25 Amp feeders with drum switches.
The bus bars are designed for a continuous load of 600 Amps at 380/220 Volts.
The switchboard is completely equipped including flat aluminium or insulated connecting conductors.
All parts and components are made of best grade material which is of an approved brand and, in cases of parts which are dynamically highly stressed or operating under pressure, accompanied by certificates supplied together with the boiler inspection book and handing-over record.
In order to obtain the necessary draught it is recommended to use a chimney 800 mm in diameter and 32 metres high, with a static draught of 22 mm of water column in the flue uptake.
The accessories of the funnel comprise the fireman's tools, the essential connecting pipes, the soot blower of the superheater, oil cups, the lubricating oil pump, a tube expander, a set of spanners and other minor items.
A set of spare parts in accordance with the list, a set of assembly drawings and a standard foundation drawing are supplied with the machine.

## BRIEF TECHNICAL DESCRIPTION:

### 1. Withdrawable fire box.

The withdrawable fire box is a specially designed individual set with efficient grate area 3.2 m². It can be easily separated from the boiler to facilitate cleaning of boiler tubes, flue tube, etc.
The withdrawable fire box is placed on channels grouted in concrete on the floor level, in about 3.5 m length.
The channels are not necessary if the concrete surface of the foundation is sufficiently smooth.
The base of the fire box is a solid cast iron frame on wheels, which carries the metal parts of the fire box and the refractory brickwork.
Special grate bars (Duplex) enable usage of various fuels: small coal, large coal, wood, shavings, etc. The grate bars are set on a frame of longitudinal and transverse iron beams.
The refractory brickwork of the fire box is in direct contact with flames and must be properly insulated against radiation. Metal casing of the fire box consists of three parts: 2 side plates and 1 upper connecting plate.

## FUEL CONSUMPTION:

Fuel consumption at maximum continuous output of the steam engine 330 HP is 1.3 kg for 1 BHP per hour with tolerance ± 5%, for the following conditions: brown coal of calorific value 4500 cal/kg is combusted, leaving a minimum 7% of ash and slag, temperature of injected water will be not higher than 22° C, and feed-water temperature not lower than 20° C.

### 2. Steam boiler.

Stationary horizontal steam boiler of welded structure with removable tubular system and a heating surface of 70 sq. meters. (For details, see inspection book of the boiler.)
Feed water for boiler can be of maximum hardness 6°. Water harder than that must be previously softened.

### 3. Steam superheater.

The superheater of heating surface 60 sq. meters has a coil system of 14 right-hand and 14 left-hand coils.
Coil tube material: steel 35.29 guaranteed.
Superheater coils are tested under hydraulic pressure of 19 at. (for details, see inspection book).

### 4. Steam engine.

Double cylinder steam engine with valve distribution system Lentz, stationary on supports welded to the upper part of the boiler, drives the generator by means of a crankshaft, pulley, and V-belts. The crankshaft runs in two main bearings with double chain lubrication of the cast frame, which is fastened to a supporting platform welded to the boiler.
With cold boiler, the steam engine must not be driven by steam from other sources.
For conditions, stated sub "Fuel consumption", steam consumption is 5.1 kg for 1 BHP per hour.

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c

**Generator**

| | | |
|---|---|---|
| 1 | — Output | 240 kW |
| 2 | — Voltage | 400/231 Volts |
| 3 | — Speed | 750 r. p. m. |
| 4 | — Frequency | 50 cycles |
| 5 | — Number of phases | 3 |
| 6 | — Power factor | 70% |
| 7 | — Output of exciter | 5.3/7.7 kW |
| 8 | — Voltage of exciter | 49/59 Volts |

| | |
|---|---|
| Overall length of set | 10 metres |
| Overall width of set | 6.2 metres |
| Overall height of set | 4.2 metres |

Total weight of set including semi-portable steam engine set, generator and spare parts 44 800 kg

**The GRAMA VI semi-portable steam engine set consists of the following assemblies:**

a — The GRAMA VI stationary condensating steam engine set

b — The withdrawable fire box

c — The type FW 406/13-8 synchronous three phase generator

d — The two-panel switchboard

b

c

d

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# CRAMA

MA[illegible] SEMI PORTABLE STEAM

## SPECIFICATION

a

**Portable Engine Set**

| | | |
|---|---|---|
| 1 — Output: | rated output | 290 HP |
| | continuous overload capacity | 330 HP |
| | maximum short period overload capacity | 370 HP |
| 2 — Speed | | 190 r. p. m. |
| 3 — Steam pressure | | 12 atm. g. |
| 4 — Temperature of overheated steam | | 320° C |
| 5 — Bore of high pressure cylinder | | 320 mm |
| Bore of low pressure cylinder | | 560 mm |
| 6 — Piston stroke | | 580 mm |
| 7 — Heating area of boiler | | 70 sq. metres |
| Heating area of superheater | | 60 sq. metres |
| 8 — Steam consumption | | 5.1 kg per HP per hour |
| 9 — Fuel consumption*) | | 1.3 kg ±5% per HP per hour |

*) Based on the assumption that brown coal with a calorific value of 4500 kCal per kg will be used, that the temperature of injected water will not be higher than 22° C and that the feed water temperature will not be lower than 20° C.

b

**Fire Box**

| | | |
|---|---|---|
| Grate area | for brown coal of a calorific value of 4500 kCal per kg | 3.2 sq. metres |

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# CRAMA

MA[illegible] SEMI[illegible] PO[illegible]TABLE ST[illegible]AM

## SPECIFICATION

a

**Portable Engine Set**

| | | |
|---|---|---|
| 1 — Output: | rated output | 290 HP |
| | continuous overload capacity | 330 HP |
| | maximum short period overload capacity | 370 HP |
| 2 — Speed | | 190 r. p. m. |
| 3 — Steam pressure | | 12 atm. g. |
| 4 — Temperature of overheated steam | | 320° C |
| 5 — Bore of high pressure cylinder | | 320 mm |
| Bore of low pressure cylinder | | 560 mm |
| 6 — Piston stroke | | 580 mm |
| 7 — Heating area of boiler | | 70 sq. metres |
| Heating area of superheater | | 60 sq. metres |
| 8 — Steam consumption | | 5.1 kg per HP per hour |
| 9 — Fuel consumption*) | | 1.3 kg ±5% per HP per hour |

*) Based on the assumption that brown coal with a calorific value of 4500 kCal per kg will be used, that the temperature of injected water will not be higher than 22° C and that the feed water temperature will not be lower than 20° C.

b

**Fire Box**

| | | |
|---|---|---|
| Grate area | | 3.2 sq. metres |
| | for brown coal of a calorific value of 4500 kCal per kg | |

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1. Brown coal as well as pit coal

2. Wood of all kinds, waste wood and saw-dust

3. Kerosene, mazout, brown coal oil and other waste oil

4. Various coke oven waste products, bagasse and many other kinds of fuel

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# MA VI.

## LE STEAM ENGINE JET

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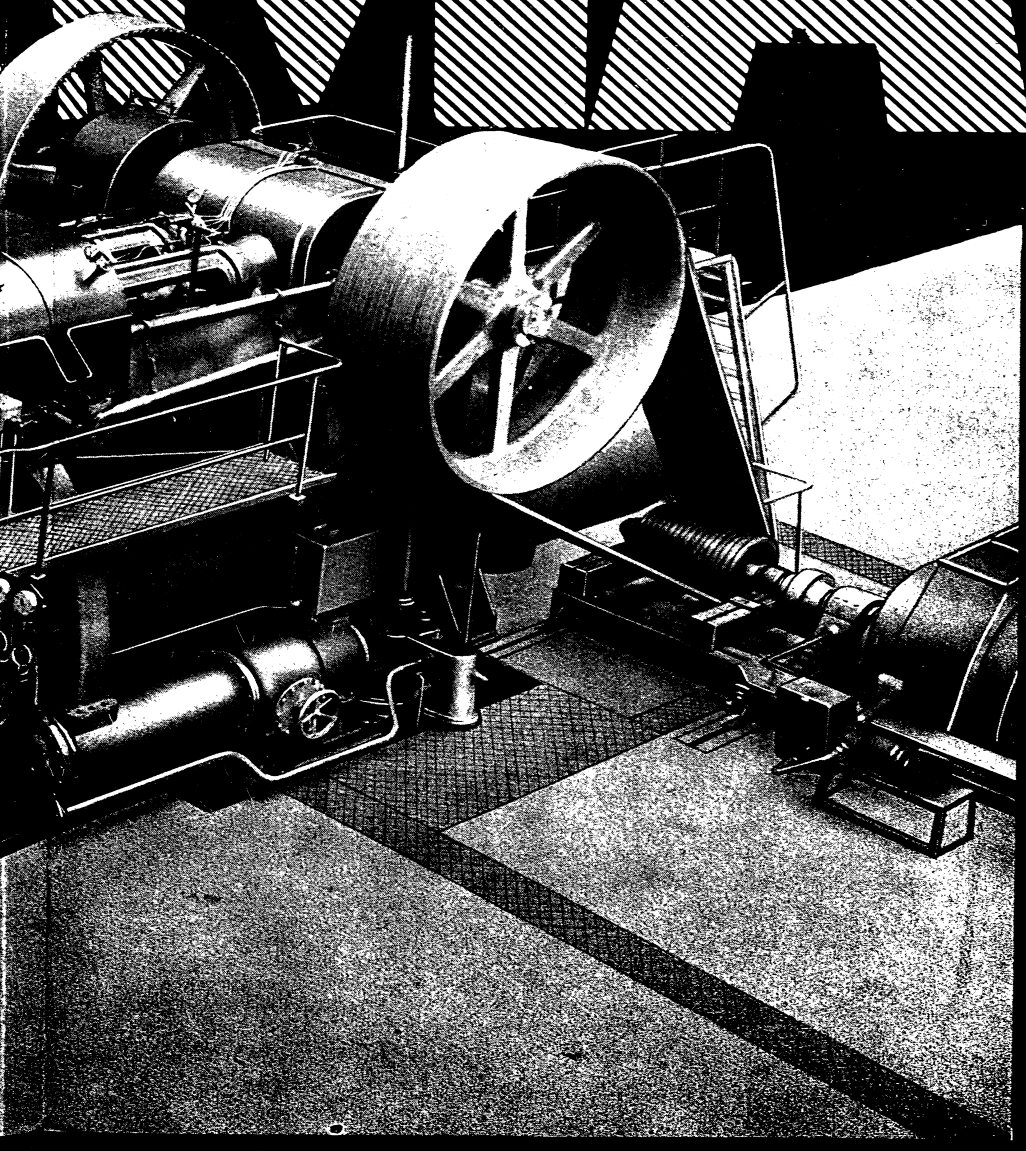

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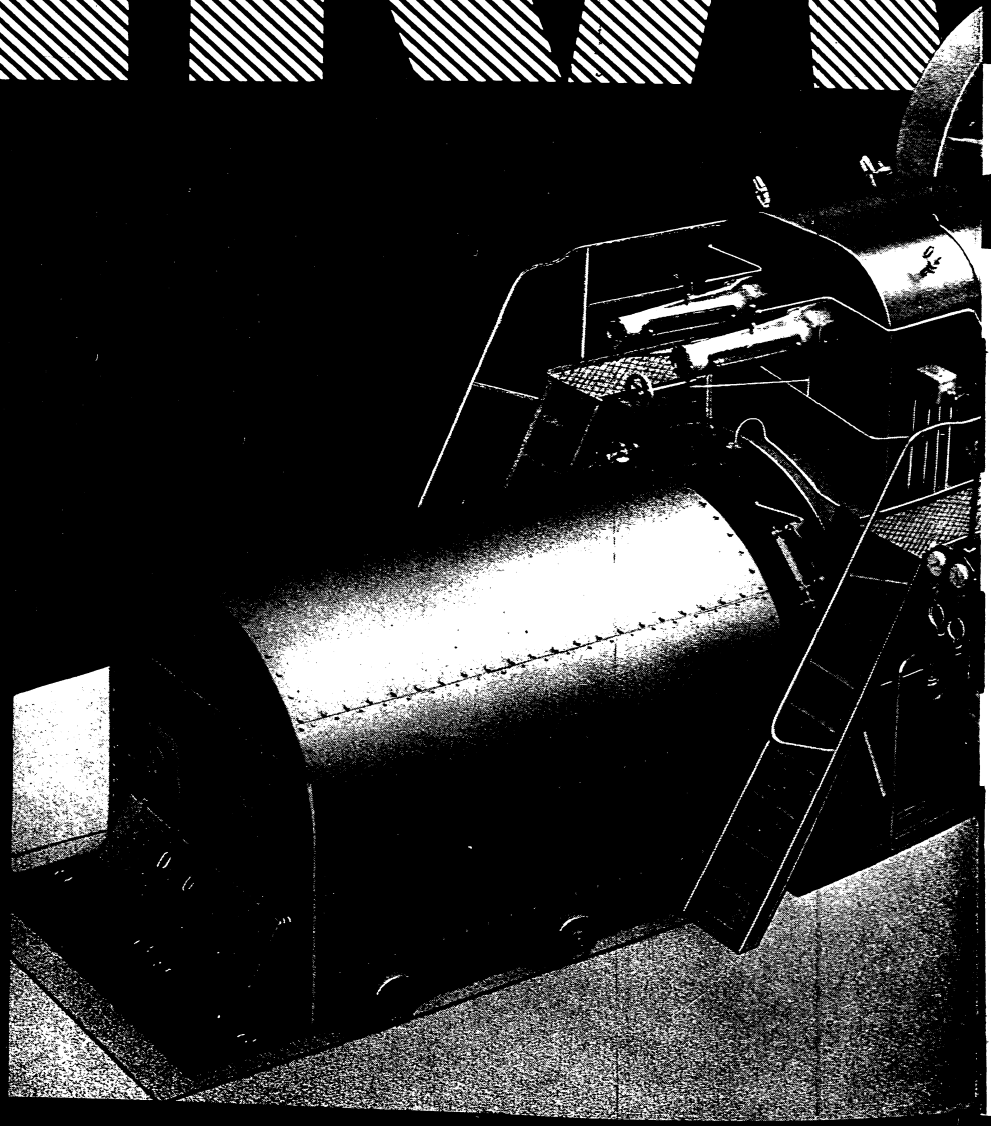
# CRAF

## MAJOR REPORT



a

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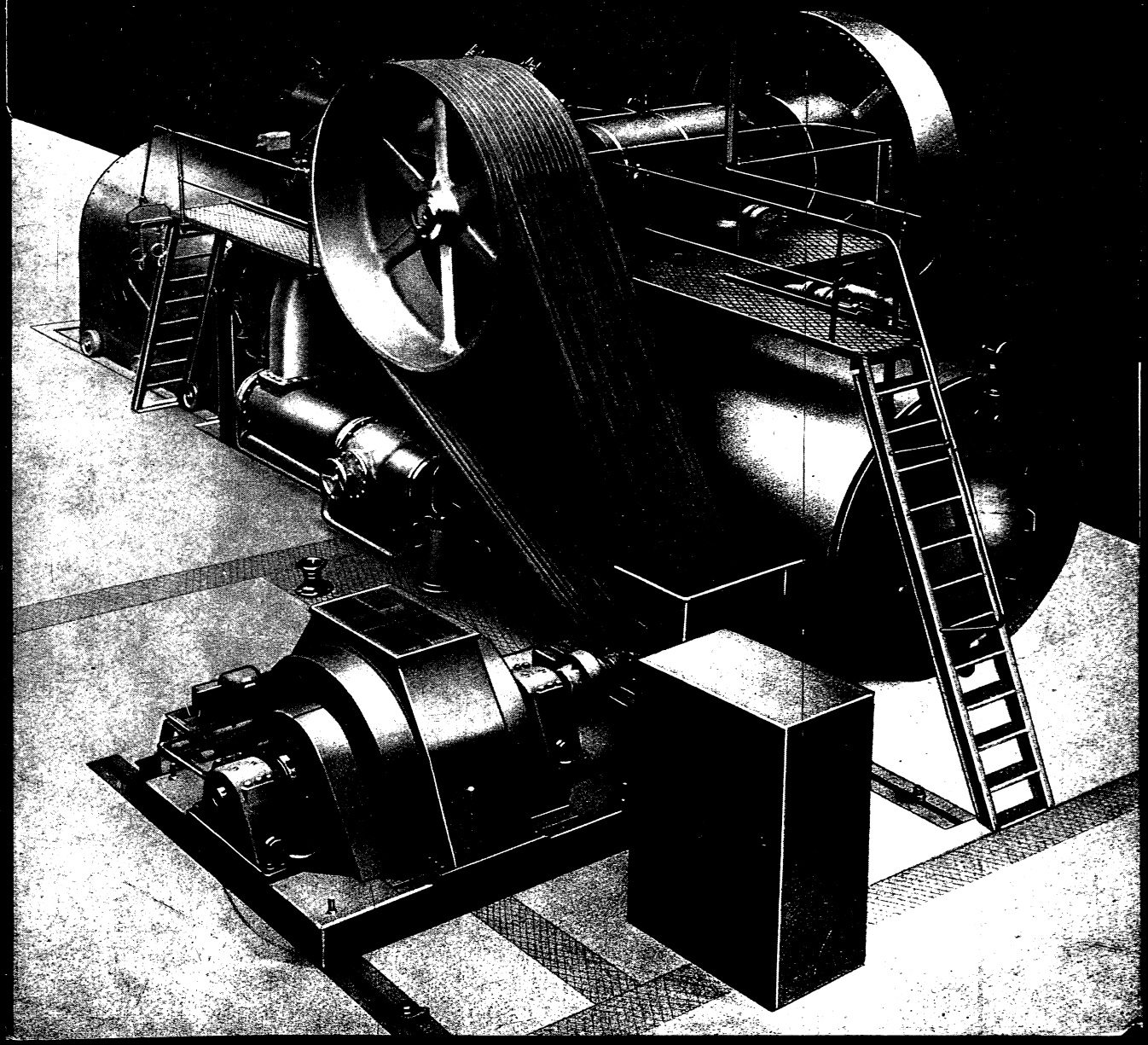
# GRAMA

## VIEW FROM GENERATOR SIDE



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# SPECIFICATION OF POLÁK TYPE 5065 MACHINE

| | |
|---|---|
| Maximum permissible weight of casting: | |
| for alloys of heavy metals | kg 15 — 33 lbs |
| for aluminium alloys | kg 15 — 33 lbs |
| Maximum permissible area of casting in parting line of die: | |
| for alloys of heavy metals | cm² 800 — 124 sq. inches |
| for aluminium alloys | cm² 1500 — 233 sq. inches |
| Average production rate per hour — depending on casting | shot 10 to 50 |
| Maximum die closing force | tons 500 |
| Pressure applied to metal | tons 11 to 44 to 70 |
| Maximum opening of machine without spacer block | mm 2200 — 86″ |
| Maximum opening of machine with spacer block | mm 1000 — 39½″ |
| Minimum opening of machine without spacer block | mm 1600 — 63″ |
| Minimum opening of machine with spacer block | mm 400 — 16″ |
| Consumption of pressure liquid per shot, approx. | litres 90 — 20 gals |
| Floor space required for machine, approx. | mm 7000 × 2000 — 23′ × 6′7″ |
| Maximum height above floor | mm 3500 — 11′6″ |
| Maximum depth below floor | mm 1800 — 5′11″ |
| Net weight of machine, approx. | kg 22500 — 49600 lbs |
| Gross weight of machine, railway packing, approx. | kg 23000 — 50700 lbs |
| Gross weight of machine, seaworthy packing, approx. | kg 26500 — 58400 lbs |

## Type RP XXX Pump

| | |
|---|---|
| Output of pump | litres per min. 100 — 22 gals per min. |
| Speed of pump | r. p. m. 340 |
| Speed of motor | r. p. m. 1440 |
| Output of motor | kW 26 |
| Floor space required for pump with motor, approx. | mm 1200 × 2400 — 48″ × 95″ |
| Net weight, approx. | kg 900 — 1980 lbs |
| Gross weight, railway packing, approx. | kg 1050 — 2310 lbs |
| Gross weight, seaworthy packing, approx. | kg 1290 — 2840 lbs |

## 750 Litre (165 gal) Accumulator — Three-Bottle

| | |
|---|---|
| Contents of bottle | litres 750 — 165 gal |
| Working pressure | atm 120 — 1700 psi |
| Floor space required | mm 1100 × 1000 — 43″ × 39″ |
| Height above floor, approx. | mm 3900 — 153″ |
| Net weight, approx. | kg 2115 — 4660 lbs |
| Gross weight, railway packing, approx. | kg 2400 — 5290 lbs |
| Gross weight, seaworthy packing, approx. | kg 2800 — 6170 lbs |

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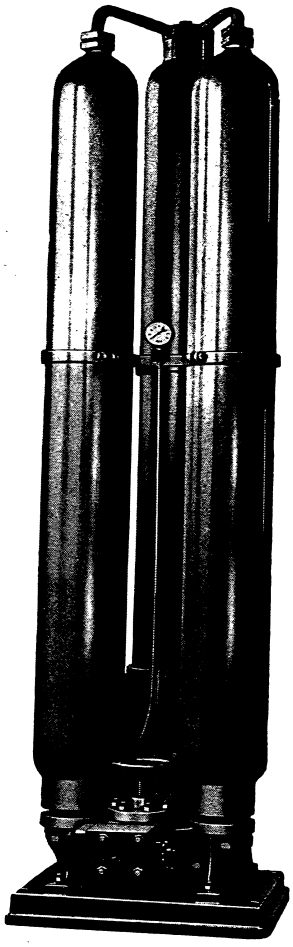
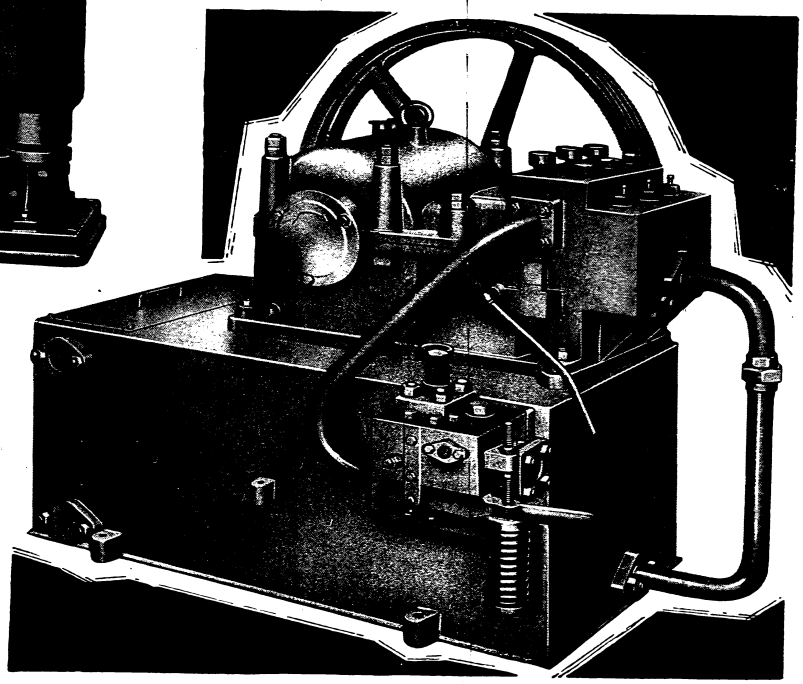


## The accumulator

is a three-bottle hydro-pneumatic unit with a total capacity of 750 litres (165 gals). It ensures the immediate availability of the requisite quantity of pressure liquid and affords an easy control of the closing and injection piston speeds independent of the pump.

## The pump

is a high speed unit with horizontal pistons, of simple design, absolutely reliable in operation. It is driven by an electric motor and stops and starts automatically in accordance with the permissible rise or drop of pressure in the accumulator.



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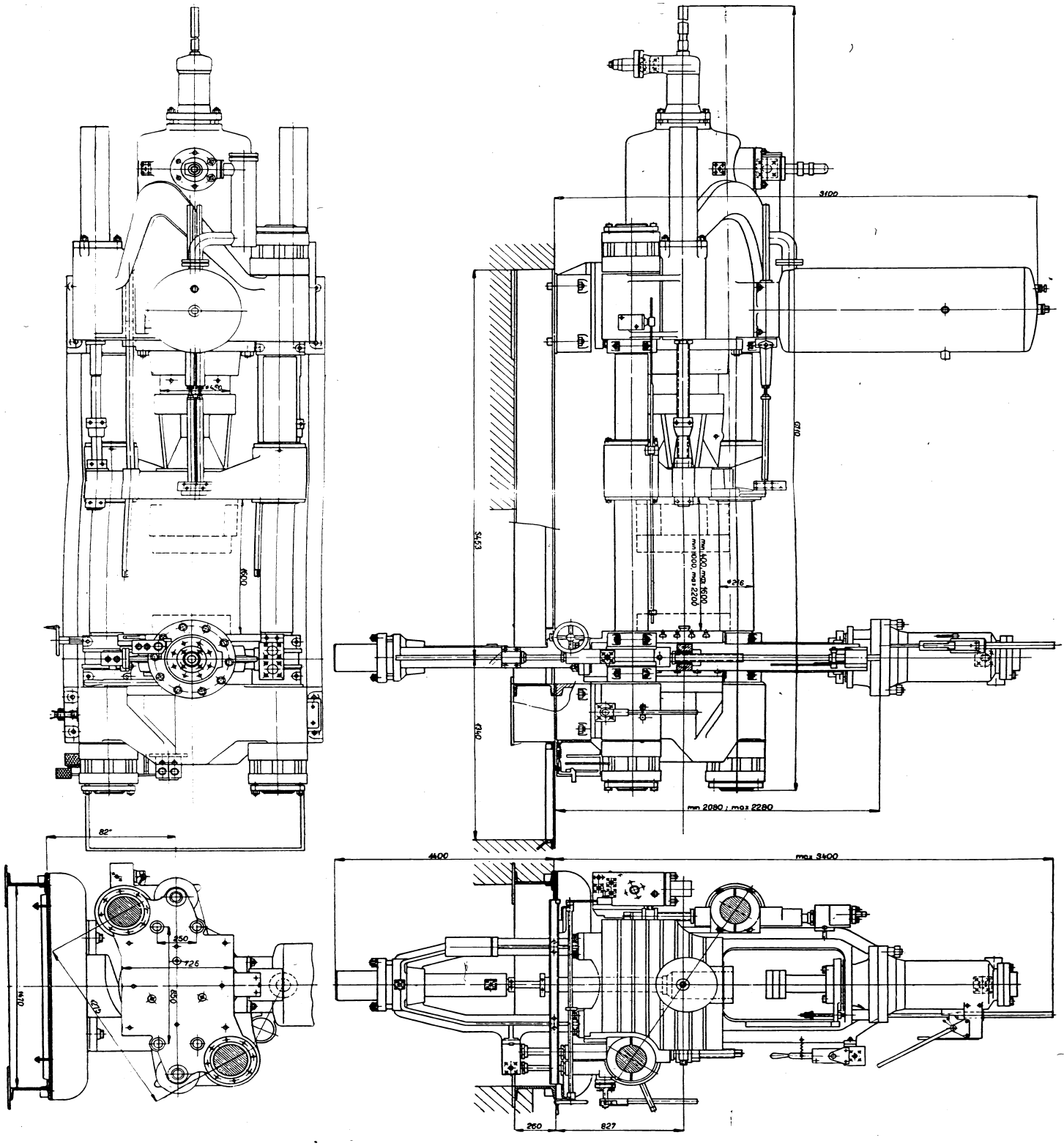


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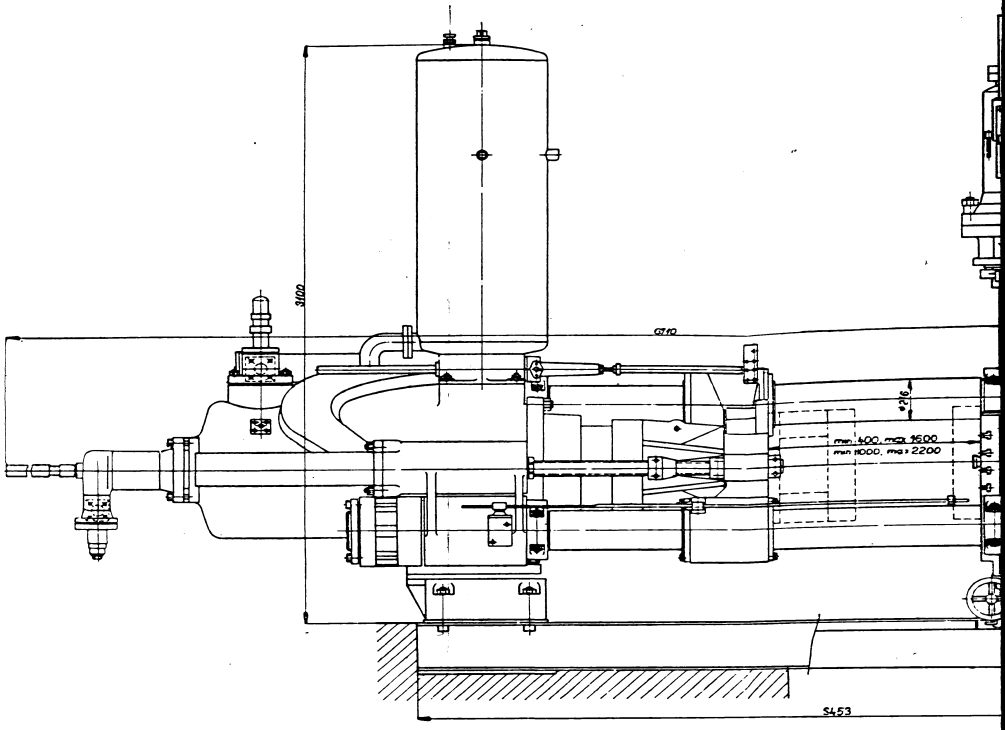



The machine, pump and accumulator form the pressure diecasting equipment. Since each of these units forms an independent assembly a central pressure piping with a central pumping plant can be set up when a fairly large number of machines is being installed.

## We supply

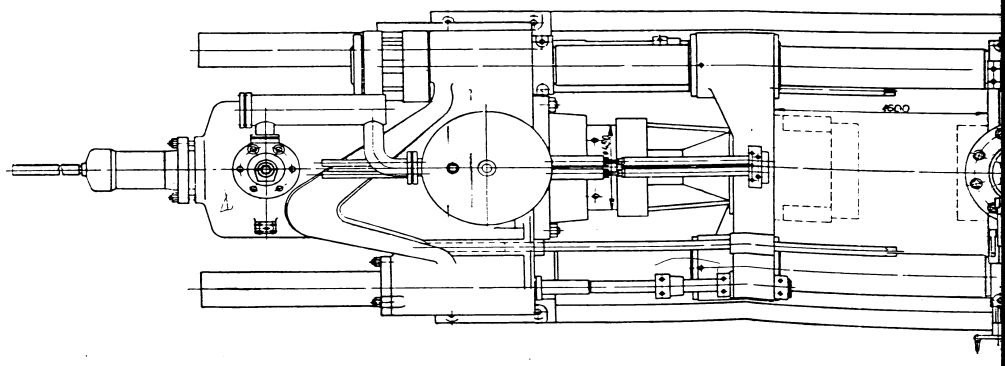
Hydraulic core-pullers
Hydraulic ejectors
Working and melting furnaces, gas or oil fired.

**We manufacture dies for diecasting of metals.**

**We prepare plans for pressure diecasting plants of all sizes.**

**We offer our advice on all problems concerning this branch.**

Our products are continuously being improved upon. The description, illustrations and particulars can therefore not always accurately agree with the latest design of machine and consequently are not binding.



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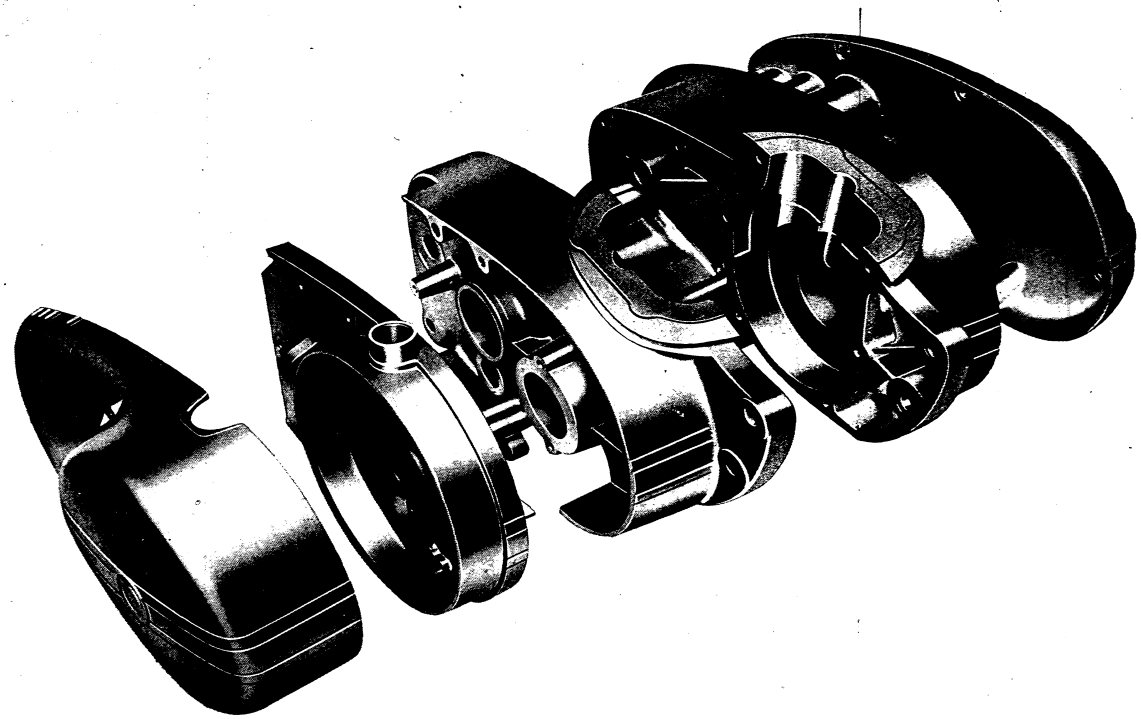

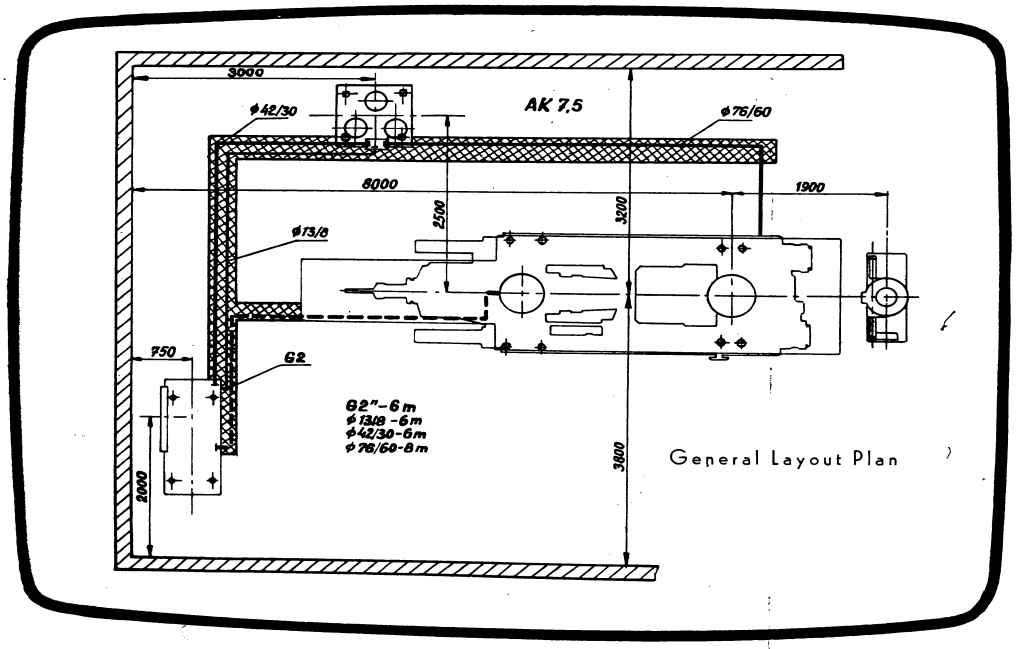


General Layout Plan

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## The pressure plunger

is made of steel and ground. To the pressure plunger the injection piston is fitted by means of an extension. It is easy to replace.

## The pressure stirrup

is made of cast steel and consists of two parts. One part of big dimensions, with lugs for the two columns, is the carrying part and transmits the full closing force. To this part the pressure stirrup proper is fitted in such a way that its position can be adjusted vertically. That permits castings with a side inlet to be always placed in the die in a position in which there can be no lateral gaping, so that the danger of metal spraying from the parting line is avoided.

## The cold pressure chamber

is fitted in the pressure stirrup. It consists of the filling box, which is provided with channels for water cooling, the cylinder and the gate. Its bottom is formed by the counter piston which has an up-and-down movement and is hydraulically operated. The cylinder and gate are made of special alloy steel to withstand the high thermal and mechanical stresses.

## The two sturdy horizontal columns

join the closing cylinder to the pressure stirrup. They transmit the full closing force and also serve as a guide for the die carrier. They are placed transversally above each other so that the die is easily accessible from all sides.

## The die carrier

is made of cast steel. In case of high dies it is bolted directly to the closing piston. In case of lower dies a spacer block is fitted between the closing piston and the die carrier. The carrier is provided with exchangeable bushes of generous dimensions by means of which it is guided into the columns.

## The hand distributor

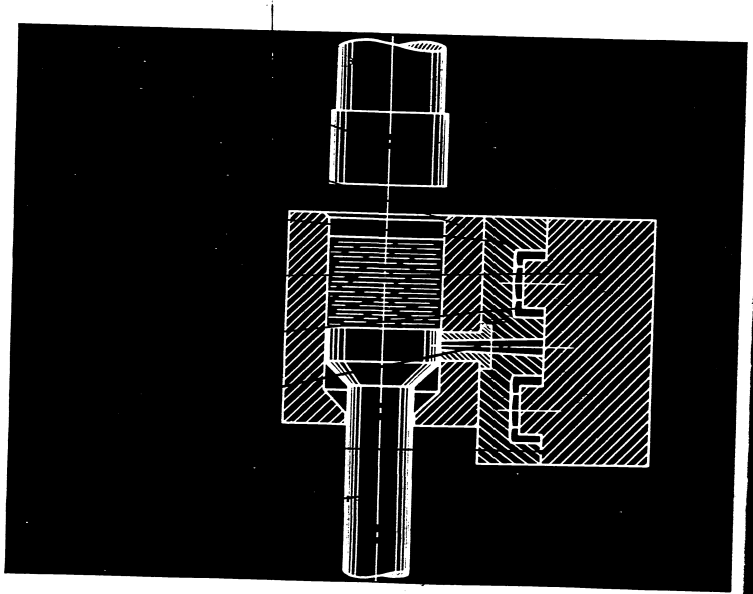
fitted to the pressure stirrup at a convenient height controls the various movements of the machine.

## The fixed half of the die

is attached to the pressure stirrup. It is provided on its seating surface with a recess for the head of the gate.

## The moving half of the die

is attached to the die carrier by means of the clamping box.



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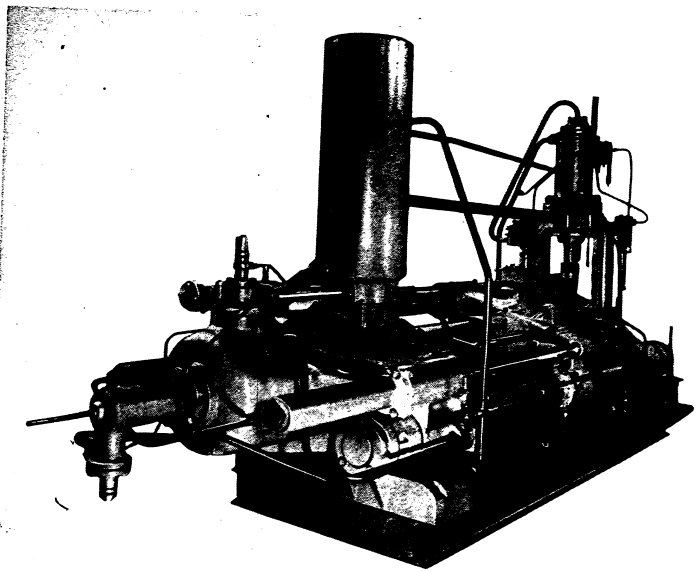

# DESCRIPTION

## The type 5065 Pressure Diecasting Machine

consists of the vertical hydraulic part known as the pressure stirrup in which the pressure chamber and the hydraulically operated counter piston are fitted, and of the horizontal closing cylinder. The two parts are joined by two columns.

## The base plate

is welded of heavy mild-steel sections.

## The closing cylinder

is made of cast steel and provided with two lugs for the fitting of the hydraulic cylinders which move the closing piston, i. e. close and open the machine. In addition to that the cylinder has two further big lugs for the attachment of the columns joining the closing cylinder to the pressure stirrup.

## The powerful closing piston

is made of special material and its surface is carefully ground to reduce the wear of sealing collars to a minimum. The piston is moved by two hydraulic cylinders fitted on either side of the closing cylinder and connected with the die carrier by means of pull-rods. When the closing piston moves forward, i. e. when the machine is being closed, the closing piston draws discharge liquid (without pressure) into the cylinder from a tank arranged above this cylinder. The liquid is drawn in through a filter and a check valve which is controlled. At the moment of closing of the machine, i. e. as soon as the two halves of the die come into contact, the check valve closes and the pressure of liquid in the closing cylinder rises to the working pressure, i. e. to 120 atm. (1700 psi). The machine is closed by the mean force. This arrangement reduces the consumption of pressure liquid to a minimum.

## The intensifier

raises the pressure of the liquid in the closing cylinder to 320 atm. (4550 psi) and thus develops the full closing force of the machine of 500 tons.

## The pressure cylinder

is fitted to the pressure stirrup of the machine and is made of cast steel. It is provided with a pressing force reducer and de-aerating valves.

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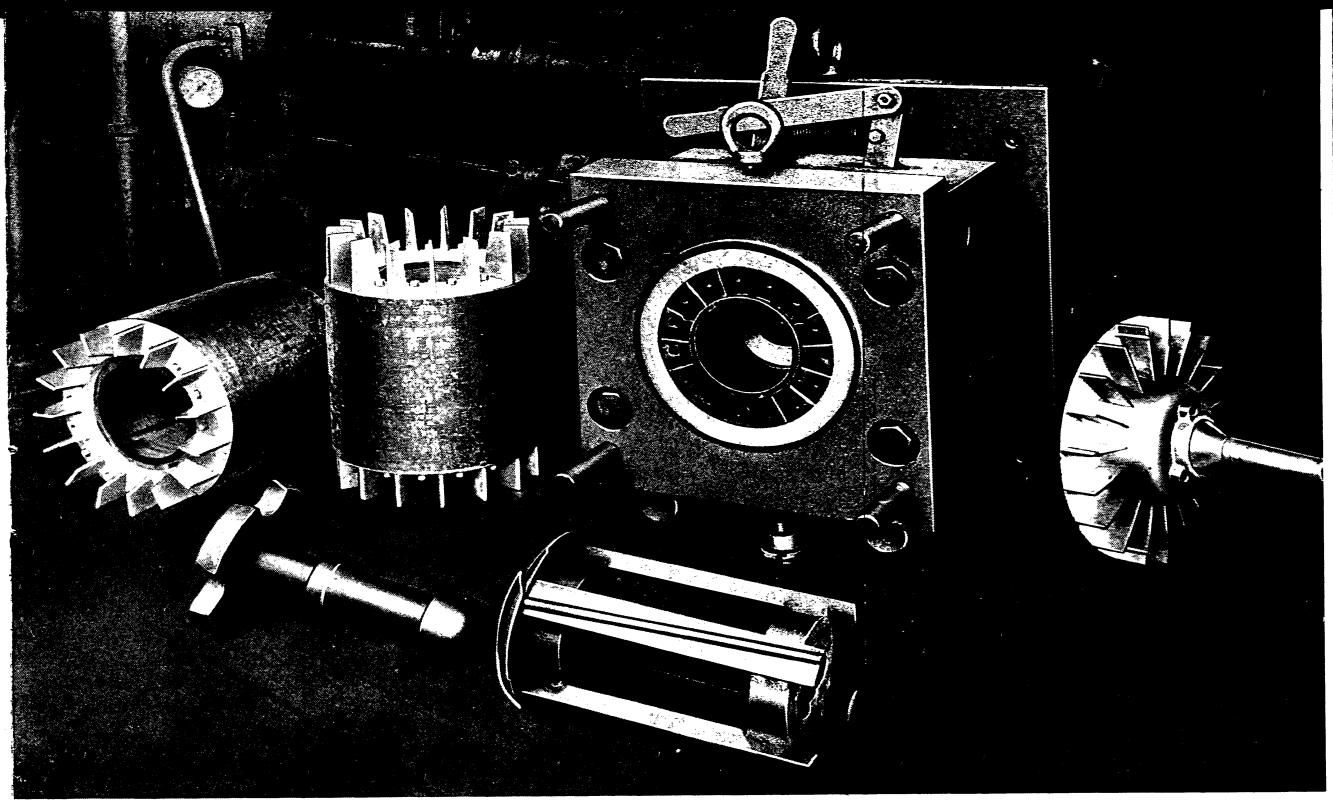

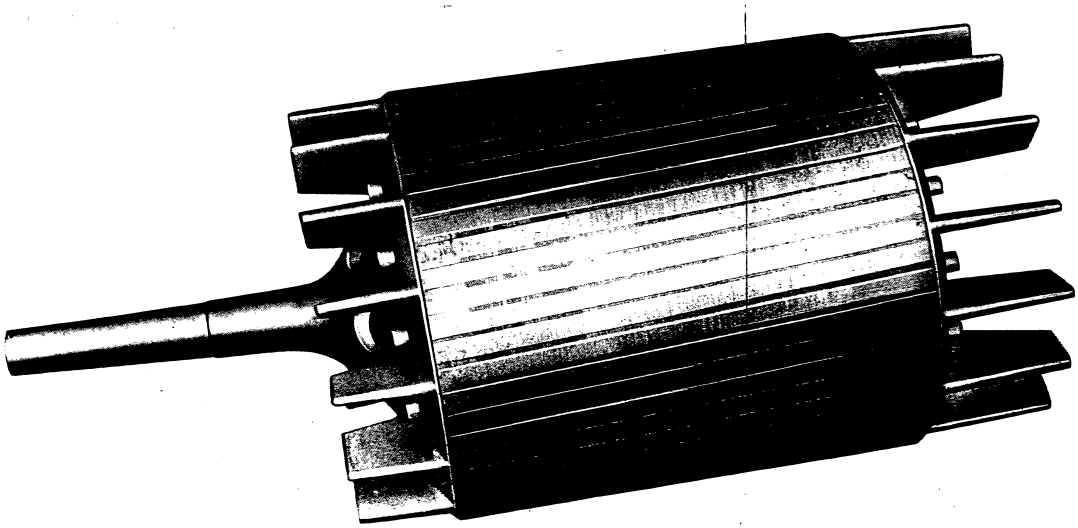

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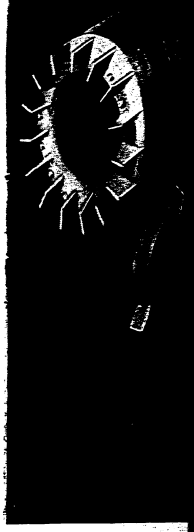
# 5065

## POLÁK 5065 PRESSURE DIECASTING MACHINE WITH COLD PRESSURE CHAMBER



### The direct transformation of material into the finished product

is an ideal which pressure diecasting closely approaches.

### Pressure diecasting

into permanent metal dies produces castings with a smooth surface which corresponds to the surface of the die. The dimensions of the castings can be kept within close limits. Castings from the same die are practically absolutely identical and satisfy the requirement of interchangeability. In the majority of cases they need not be machined at all and can be fitted immediately.

### High strengths

of castings result in a considerable saving of material in view of the fact that walls can be made thinner.

### Some examples of applications of the POLÁK 5065

Crank cases, crank case covers and cylinder heads of motor cycle engines — Retors, stators, end shields and fans of electric motors — Frames and parts of typewriters and calculating machines — Parts of automatic scales for shops — Frames and stands of various optical and measuring instruments — Parts of household refrigerators, vacuum cleaners, floor polishers and various other household appliances. Various other castings whenever the quantity required exceeds 2 to 4000 and where their surface, weight, accurate dimensions and mechanical properties are of importance.

## OUTSTANDING FEATURES

- High rate of production of accurate, high grade castings.
- Two-column design limiting the access to the die to a very small extent. The fitting of the die is quick and its inspection during operation easy.
- Hydraulic closing of die. Dies of various heights can be fitted without any adjustment of the closing parts of the machine.
- Wide opening of machine permits even abnormally high dies to be fitted.
- Cold pressure chamber and high specific pressure upon metal. The casting temperature of the metal is the lowest possible which considerably increases the life of the die.
- Vertical arrangement of pressure chamber eliminates the possibility of air being forced into the hollow of the mould which would produce air bubbles in the casting.
- Simple operation and easy access to all important parts and to the hydraulic line.
- Simple and reliable control.
- Safe operation-no fire hazard, the pressure liquid used being an emulsion of water and oil.

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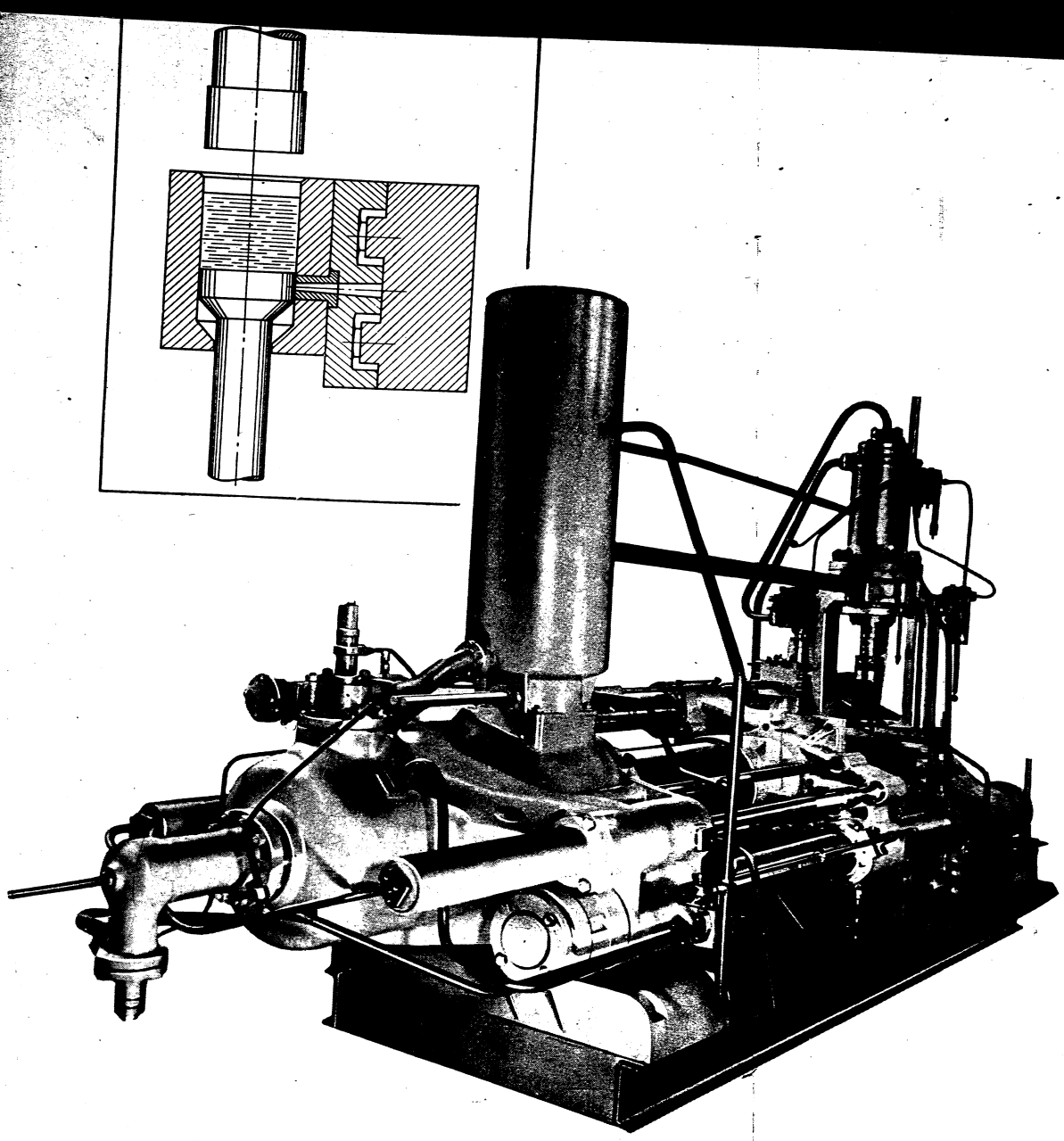

PRESSURE DIECASTING MACHINE

# POLAR 5065

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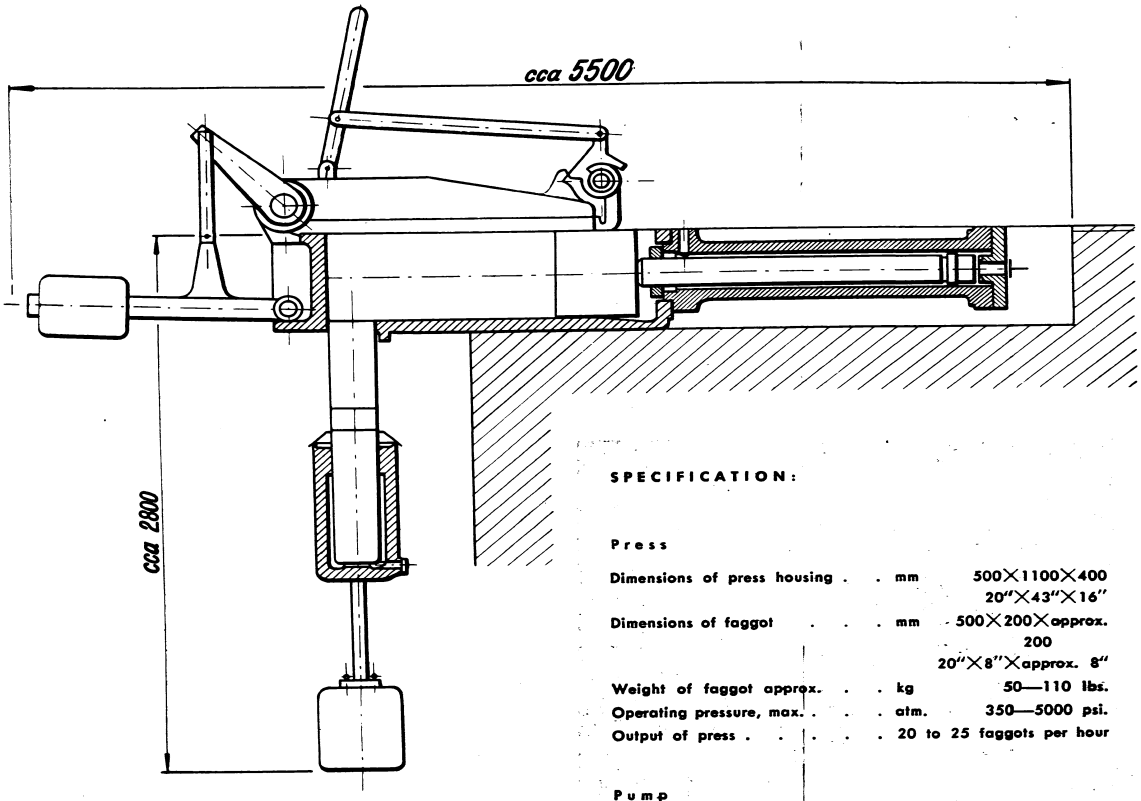


**SPECIFICATION:**

**Press**

| | | |
|---|---|---|
| Dimensions of press housing | mm | 500×1100×400 |
| | | 20"×43"×16" |
| Dimensions of faggot | mm | 500×200×approx. 200 |
| | | 20"×8"×approx. 8" |
| Weight of faggot approx. | kg | 50—110 lbs. |
| Operating pressure, max. | atm. | 350—5000 psi. |
| Output of press | | 20 to 25 faggots per hour |

**Pump**

| | | |
|---|---|---|
| Output per minute | litres | 100.4/15.4 |
| | Imp. Galls. | 22.13/3.40 |
| Pressure | atm. | 64/350 |
| | psi. | 910/5000 |
| Stroke | mm | 50—1 31/32" |
| Diameter of plungers | mm | 3×55×5 and 3×24 |
| | | 3×2 5/32"×3/16" and 3×15/16" |
| Speed | r. p. m. | 253 |
| Input on pump shaft, approx. | HP | 21 |

Electric motor 380/220 Volts, 50 cycles:

| | | |
|---|---|---|
| Continuous rating | HP | 27 |
| Speed | r. p. m. | 1430 |
| Volume of packing box | cu. metres | — cu. ft. |

Please state the operating voltage in your order.

Changes of details of design reserved.

# STROJEXPORT

PRAHA • CZECHOSLOVAKIA

ČOK 520728 a — 5505

Printed in Czechoslovakia PRÁCE 06 - 12848

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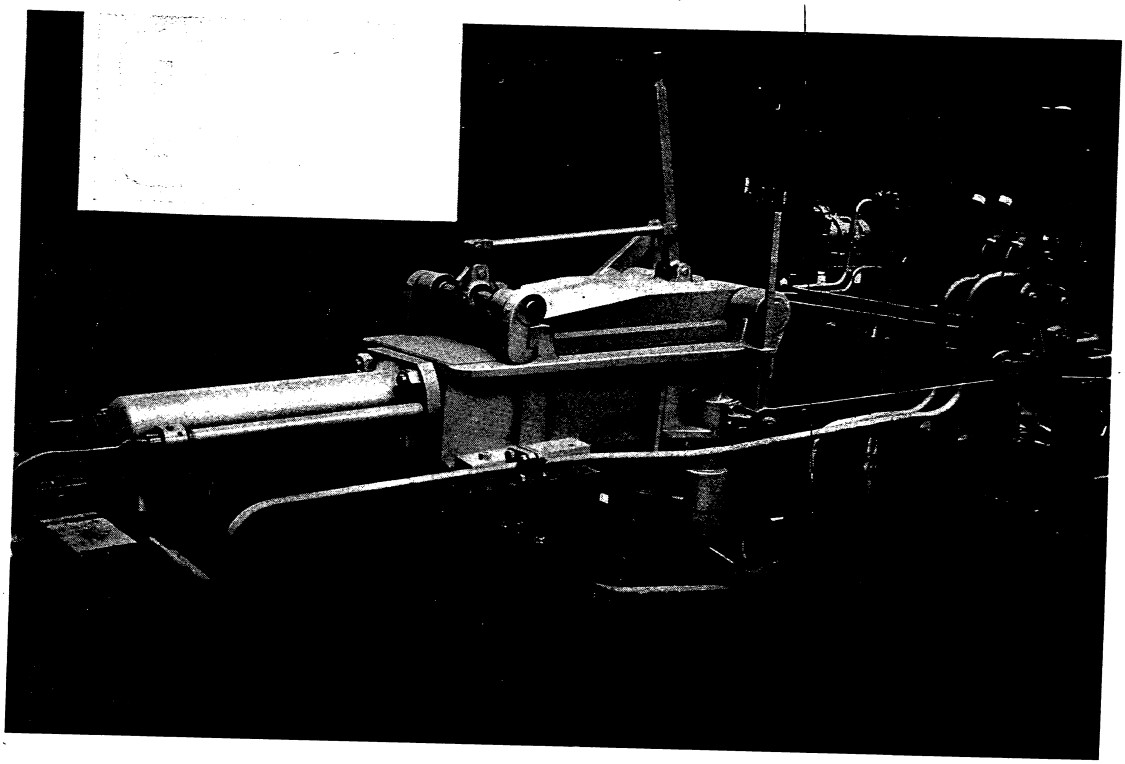

# TYPE CPA 100, 100 TON HYDRAULIC FAGGOTING PRESS

The press is intended for the faggoting of iron chips, light iron scrap and non-ferrous metal chips and is driven by a pressure pump.

The main parts of the press are the press housing with a cover, the horizontal cylinder, the vertical cylinder, the distribution and the pressure pump disengaging unit. The cover of the housing is opened by means of a hand lever. The return movement of the horizontal cylinder is operated hydraulically and that of the vertical cylinder by means of a weight.

Operating Procedure: The press housing is filled with chips and the cover closed. The horizontal plunger presses the chips together in one direction. This is followed by vertical pressing. Both working pressures having been relieved by the distribution, the cover is opened. The vertical plunger then pushes the finished faggot to the edge of the press housing from which the faggot is removed. The pressing operation described above is controlled by the distribution from the operator's post.

The press housing is made of cast steel and lined with hard plates which can be replaced when worn.

The hydraulic cylinders are sealed with leather collars which are easy to replace.

Standard Equipment: distribution, disengaging unit, water tank, connecting piping between pump and press.

Total weight . . . . . 6700 kg — 14770 lbs.

## TYPE 3R/6 PRESSURE PUMP

Six plunger pressure pump driven by an electric motor by means of a gear box and flexible coupling, two pressure design.

Liquid: water.

The frame and gear box are made of cast iron, the pump bodies and crankshaft of forged steel, the valves and valve seats of stainless steel. The plungers are hardened and ground. The pump is equipped with circulating lubrication.

Weight . . . . . 1630 kg — 3590 lbs.

## ELECTRICAL EQUIPMENT

1 three phase induction motor for the drive of the pressure pump, surface cooled, with slip ring motor with brush lifting device, with free shaft end.

Weight approximately . . . . . 290 kg — 640 lbs.

1 oil immersed resistance starter, weight . . . . . 15 kg — 33 lbs.

1 automatic circuit breaker, 60 Amps, with electromagnetic and thermal overcurrent protection in two phases, with ammeter, weight . . . . . 13 kg — 29 lbs.

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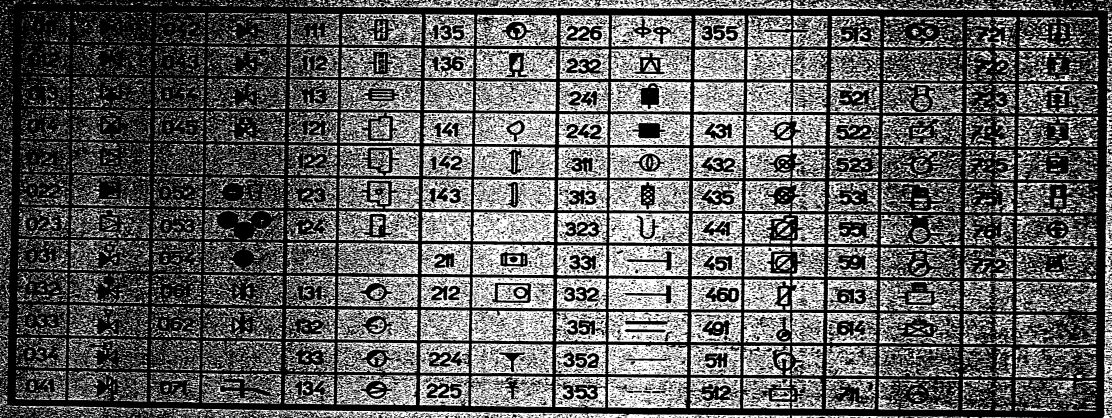
# TABLE SHOWING THE MARKING OF MACHINES AND APPARATUS



011 — Closing valve
012 — Regulating valve
013 — Distributing valve T
014 — Distributing valve with branch
021 — Non-return valve
022 — Non-return closing valve
023 — Over-pressure valve
031 — Pneumatic valve
032 — Electro-magnetic valve
033 — Over-flow check valve
034 — Quick closing valve
041 — Float valve
042 — Weight-loaded safety valve
043 — Spring-loaded safety valve
044 — Reduction valve
045 — Valve with automatic stopping of pump

052 — Straight cock
053 — Three-way cock
054 — Four-way cock
061 — Slide valve
062 — Regulating slide valve

071 — Outflow nozzle
111 — Strainer
112 — Fine filter
113 — Slot filter
121 — Air separator
122 — Water separator
123 — Oil separator
124 — Equalizing vessel

131 — Direct sight glass
132 — Drip-type sight glass
133 — Overflow sight glass
134 — Sight glass with non-return valve
135 — Illuminated sight glass
136 — Cylindrical sight glass
141 — Tape level indicator
142 — Tube level indicator with needle valves
143 — Tube level indicator

211 — Barrel
212 — Storage tank

224 — Mud separator
225 — Overflow protective device
226 — Float nozzle
232 — Suction strainer with non-return valve
241 — Air safety device, end mounted
242 — Air and liquid safety device
311 — Mixing chamber
313 — Air dryer
323 — Siphon closing device
331 — Screwed hose joint
332 — Blind flange
351 — Piping for liquids
352 — Piping for gases
353 — Electrical connections
355 — Shaft coupling

431 — Tankmeter
432 — Tankmeter with a mixing plant counter
435 — Tankmeter with a mixing plant counter for prese ected issue
441 — Tankmeter with separators
451 — High pressure tankmeter
460 — HEFA speedometer
491 — Remote reading counter
511 — Centrifugal pump
512 — Self-priming pump
513 — Gear pump

521 — Motor-driven piston pump
522 — Hand-driven piston pump
523 — Hand-driven wing-pump
531 — Pneumatic pump
551 — Compressor
591 — Ethylization measuring pump
613 — Internal combustion engine
614 — Electric motor

711 — Pumping group
721 — One-way measuring group
722 — In-Ex measuring group
723 — One-way pumping and measuring group
724 — In-Ex pumping and measuring group
725 — Pumping and measuring group with ethylisation
751 — Kerb-side pump
761 — Airport pit with „FF" filter and issuing hose
772 — Equipment for filling of cans with a measuring device

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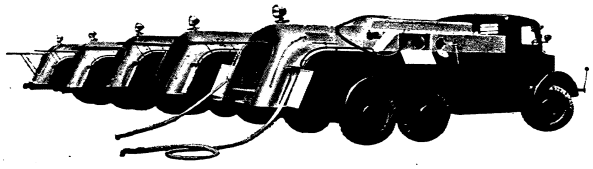
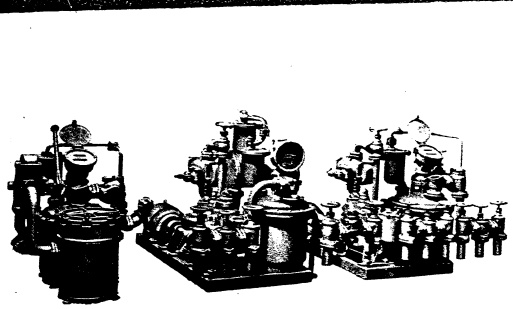
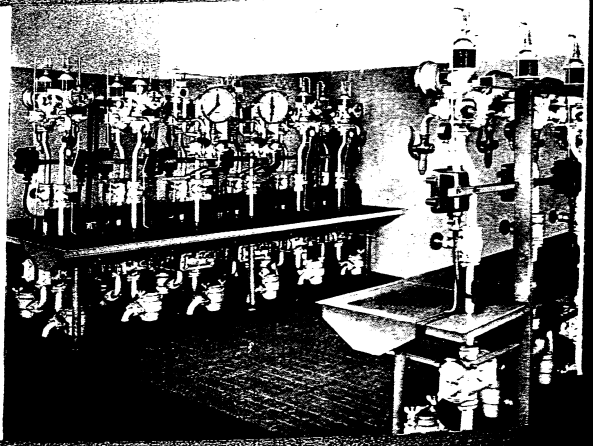
A number of patents used at home as well as by various firms abroad bear witness to the technical pioneering activity of our designers. Mainly due to this our firm never experienced any slump and extended production even at a time when other firms were compelled to restrict their production.

Even now we are steadily extending the scope of manufacture and are supplying an ever increasing quantity of products for the home and export markets.



**Fuel measuring pumps of different type for refueling stations.**





**Complete equipment for store houses handling lubricants, solvents, etc. in factories, locomotive sheds, etc.**

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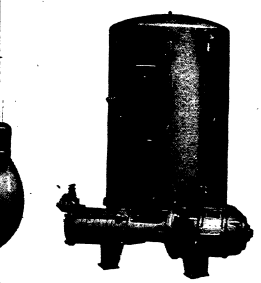
lubricating oils and
s, edible oils and
particular: kerb-side
plants for lubricating
h the smallest up to
50 mm.
l outline only; to-

The afore mentioned equipment is supplemented by the production of:

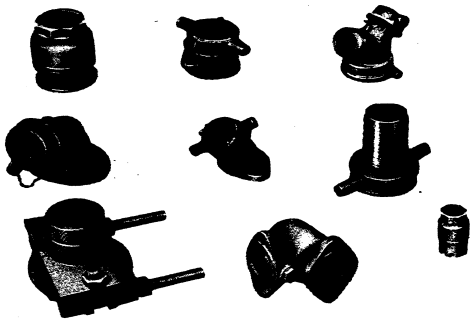
Self-priming pumps for private water supply plants,
water sealed ring-type vacuum pumps,
rubber tube inflating compressors.

The rapid growth and the world-wide reputation of the enterprise are due to the perfect designs incorporating all the latest technical features, and to the excellent workmanship and first-grade materials which are characteristic of all the products.



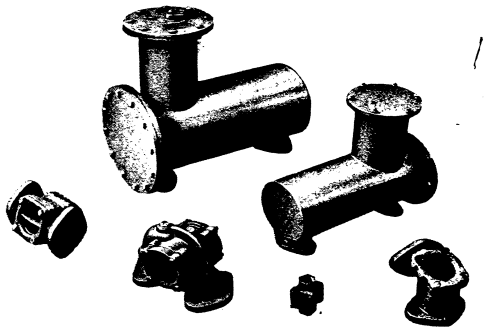
DDP 300/313

Strainers, screwed hose joints, universal connecting branches for tanks, various screwed joints and fittings

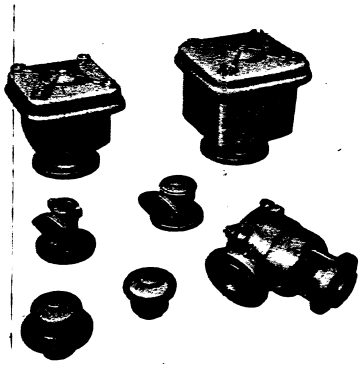


Closing and distributing fittings, valves and slide valves of different sizes and types

Vapour and gas separators ensuring correct operation of flow meters. Sight glasses



Honeycomb or plate type safety devices against penetration of flame



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pany bearing
IX founded

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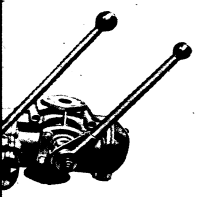
ral hundred

, measuring,

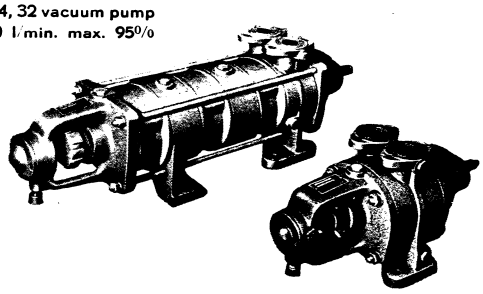
pumping, conveying and issuing of liquid fuels (petrol and its mixtures), lubricating oils and liquids of similar composition such as thinning mediums, paints, fats, edible oils and various chemical products. The manufacturing programme includes in particular: kerb-side pumps, large petrol storage establishments, fuel transport tanks, storage plants for lubricating oils, various equipment for the issue of lubricating oils, flow meters from the smallest up to the largest capacities used in long-distance piping of diameters up to 250 mm.
Special auxiliary equipment are dealt with in this prospectus in general outline only; for particulars see our special literature.

[illegible] plants with self-priming [illegible] water tanks of 100, 150, 300 and 500 [illegible]

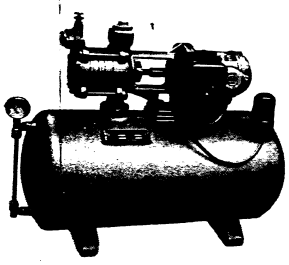


Pb 60

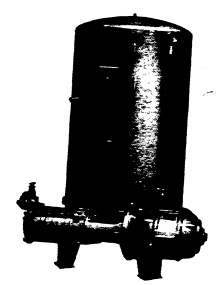
L 124, 32 vacuum pump
2000 l/min. max. 95%



L 102, 25, 200 l/min. max. 50%



DMP 100/212

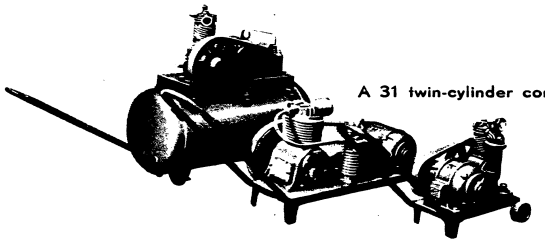


DDP 300/313

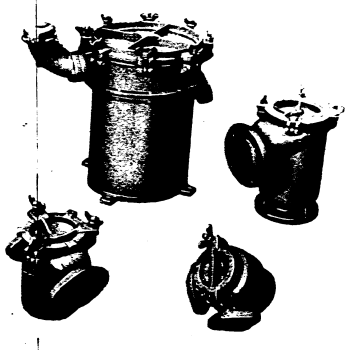
[illegible] Large surface strainers for mechanical impurities suitable for finest filtration. Water separators.

J 10

A 21 compressor with tank



A 31 twin-cylinder compressor



A 21 tyre tube inflating compressor

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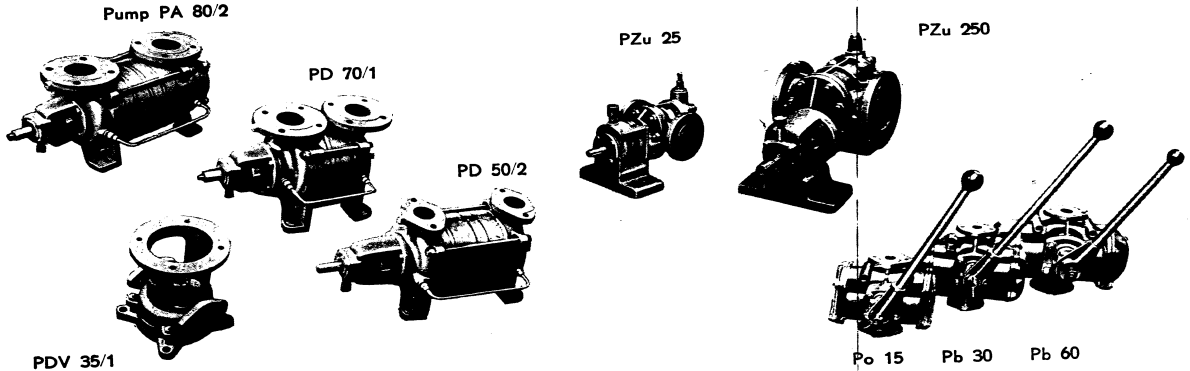
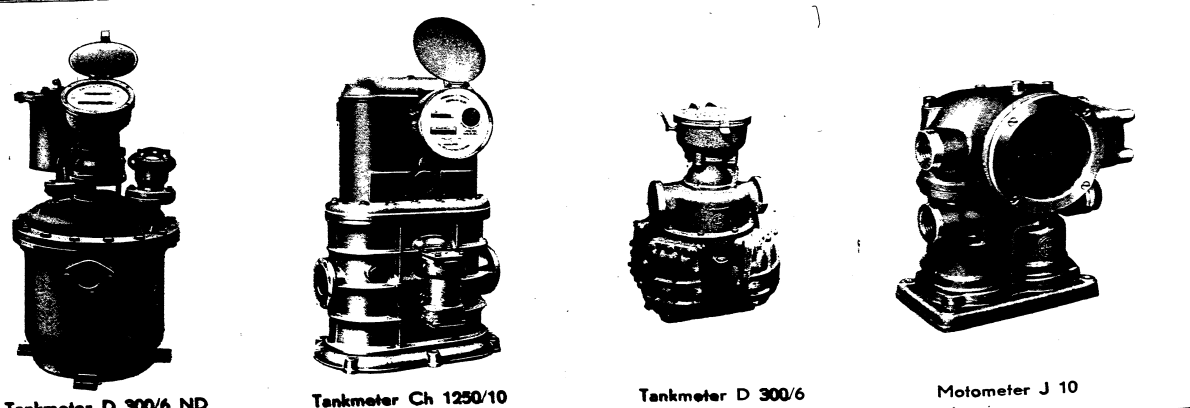
The HEFA National Corporation is the successor of a former Trading Company bearing the same name and of Messrs Ing. Hejduk & Feix, Ltd. in Prague IX founded in 1924.

From very modest beginnings, a shop with two workers, an enterprise of world-wide repute and importance has grovn during the 25 years of its existence.

At present manufacture is carried on in several plants emplpying several hundred workers.

The manufacturing programme of the firm comprises equipment for storage, measuring,

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# SUMMARY OF PRODUCTS

ENQUIRIES AND EXPORT:

**KOVO** LIMITED, METAL AND ENGINEERING PRODUCTS AND RAW MATERIALS TRADING COMPANY

PRAHA • CZECHOSLOVAKIA

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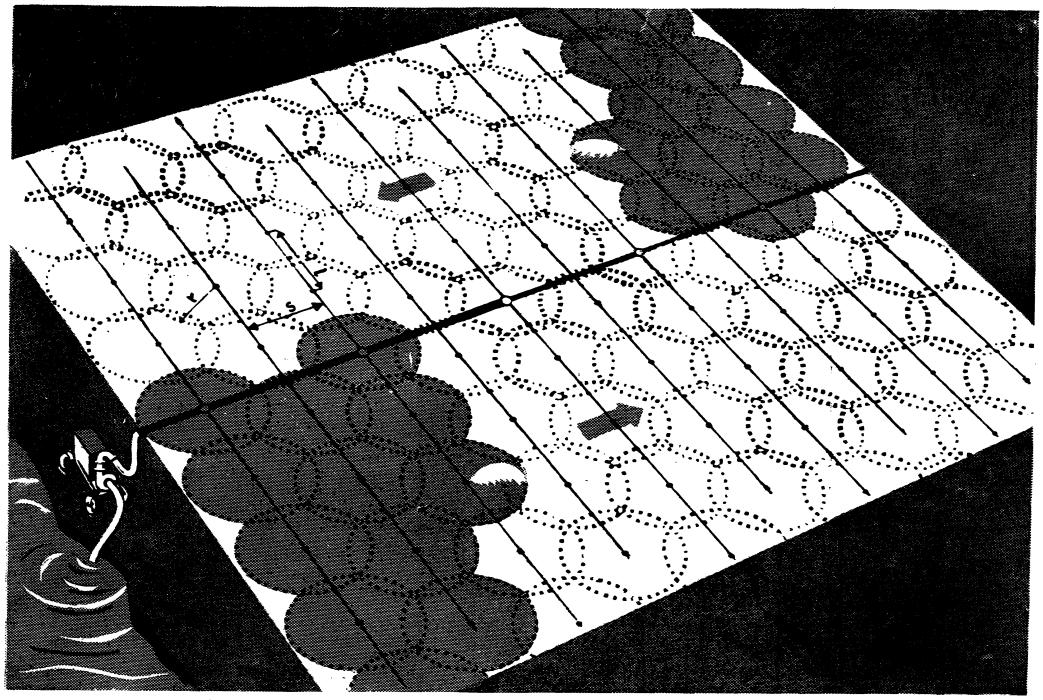
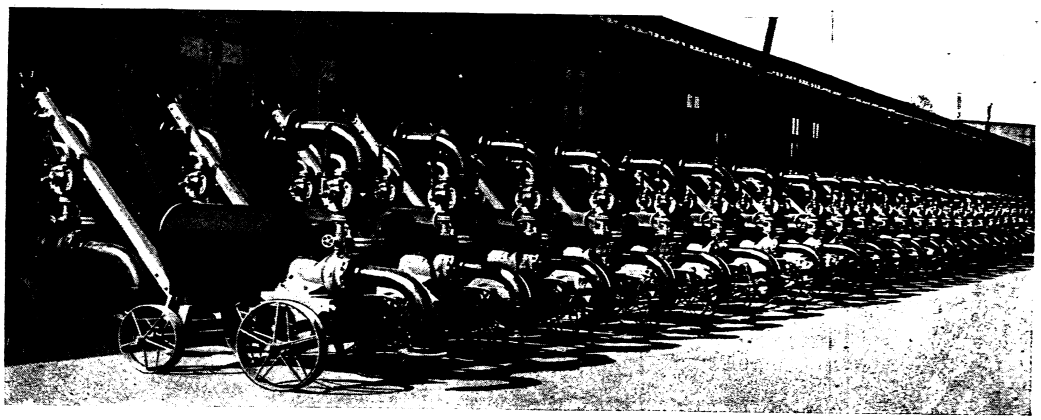


**No 24. Diagramatic arrangement of an Irrigation system using "ROT-REVOLT" rainers. The rainers are placed at the centre of the circles, and moved along the subsidiary pipe-line. When the irrigation of this line is completed, the subsidiary pipe-line is moved further along the land to be irrigated.**



**No 25. View of a series of Irrigation Pumping Sets supplied to foreign countries.**

# SIGMA PUMPS

## NATIONAL CORPORATION OLOMOUC CZECHOSLOVAKIA

6601/A

PRINTED IN CZECHOSLOVAKIA

ČOK 503 6a - 5205 - Sčt 02 3815

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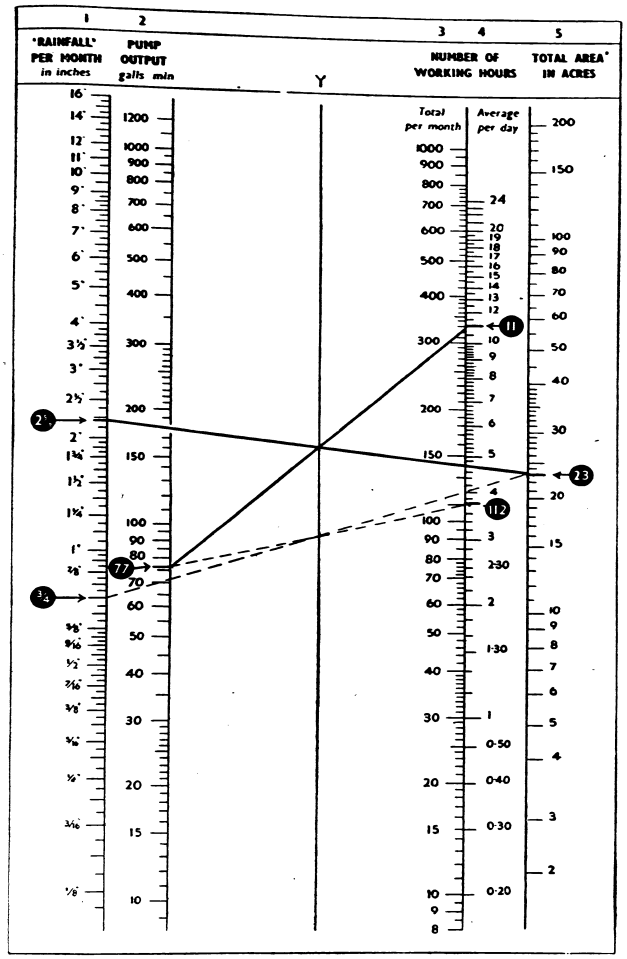



No 22.

## CHART SHOWING COMPARISON BETWEEN THE PUMP OUTPUT, "RAINFALL", WORKING HOURS AND IRRIGATED ACREAGE

To demonstrate the use of the chart, the following example is given. If 23 acres are to receive $2^{5}/_{16}$" "rainfall" monthly at an average of 11 hours a day, a pump of 77 Imp. G. P. M. capacity will be required. If only $^{3}/_{4}$" "rainfall" is required monthly, for the same pump capacity and acreage, the number of working hours mounthly will be only 112. In other words, first connect columns 1 and 5, then draw a line connecting 4 and 2 at the intersection of the first line with the "y" axis.

## BELT-DRIVEN PUMPS FOR USE WITH ANY KIND OF POWER UNIT

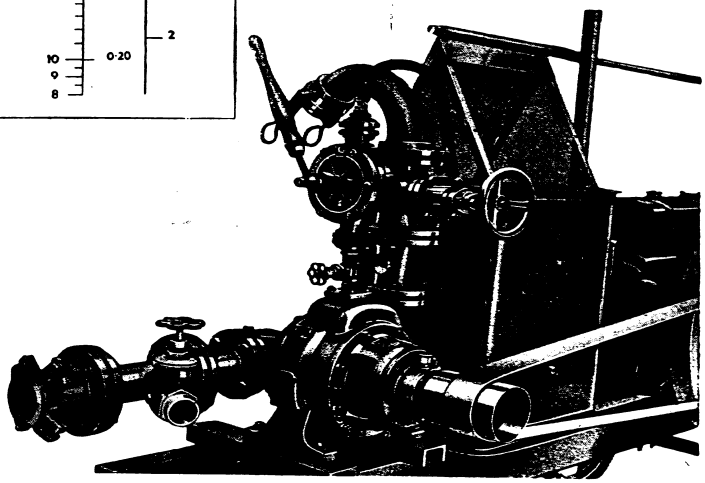
**For driving irrigation pumps, any kind of power unit may be used, such as, tractors, steam engines, electric motors etc. We can then supply a pump, equipped with a pulley (Drive "R") or with coupling, jack shaft, supporting bearings and pulley (Drive "FLRL"). For other types of drive see separate leaflet on Types of Drives. Units can be either stationary (Illustr. 21) or transportable, mounted on a four-wheeled truck (Illustr. 22).**

## LIQUID MANURING COMBINED WITH OVERHEAD IRRIGATION

Better results in plant growth will be achieved by liquid manuring, carried out simultaneously with overhead irrigation. To effect this, the suction line is fitted with a "T"-piece and sluice-valve, to which a subsidiary suction line, of smaller diameter, leading to the manure sump or cart, is connected. Thus crops may be irrigated with a mixture of clean water and liquid manure, the concentration of which can be easily controlled by the sluice-valve.

The concentration of the mixture will, of course, depend on the kind of crops to be irrigated, on the season and on the stage of growth of the plants. The usual proportion of liquid manure to water is 1:10, i. e. 1 part of liquid manure to 10 parts of water. In spring time, before growth, before or after rain, the concentration may be richer.

Additional Liquid Manuring Accessories; "T"-piece and sluice-valve may be supplied at extra charge.



No 23. Irrigation Pump with Air-Priming Wing-Pump and Equipment for simultaneous liquid-manuring.



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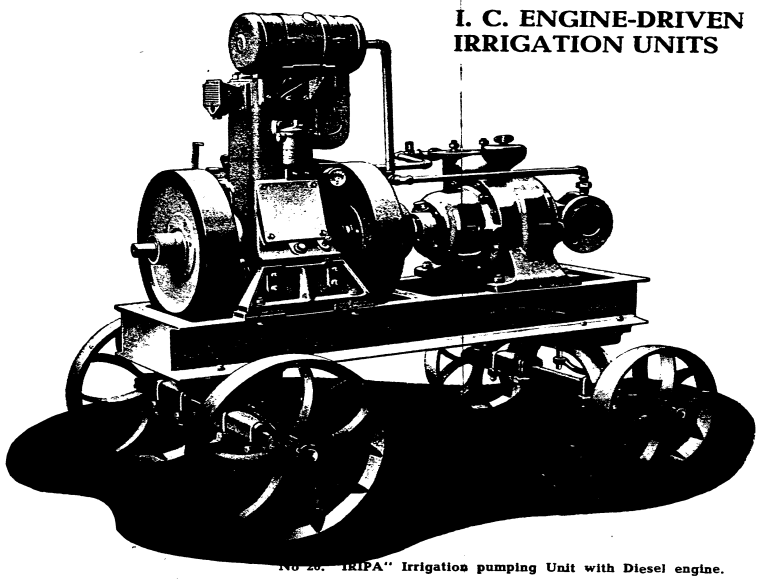
## ACCESSORIES

### The following accessories may be supplied at extra charge

Four cord special cable ("HGD") - size of cable according to HP, fourpole watertight socket and plug for 25 amp.; oil protecting switch ("HMG"), including initial supply of oil (at 380 V is suitable for motors up to 13 H. P., and at 220 V up to 7.5 H. P. - for higher H. P. quotations on demand). Control and closing valve No 383 (for diameters of 3" and larger, a cast iron sluice-valve). We recommend this accessory for the control of the capacity on the discharge side of the pump, and also for closing the discharge valve, when the pump is initially started (thus relieving the motor), and for complete shutting off of the discharge. A priming hand-pump may be fitted to the pump to prime the main pump and the suction piping. When priming, the discharge must be closed. **NOTE.** For larger pumps, to be used for extensive irrigation schemes, we will quote on demand. For technical details of irrigation pumping units, driven by diesel, petrol or kerosene engines, see our special leaflets - "IRIPA", "IRIPA-R", "IRILO", "IRIWI" and "IRISKO".

## I. C. ENGINE-DRIVEN IRRIGATION UNITS



No 20. "IRIPA" Irrigation pumping Unit with Diesel engine.

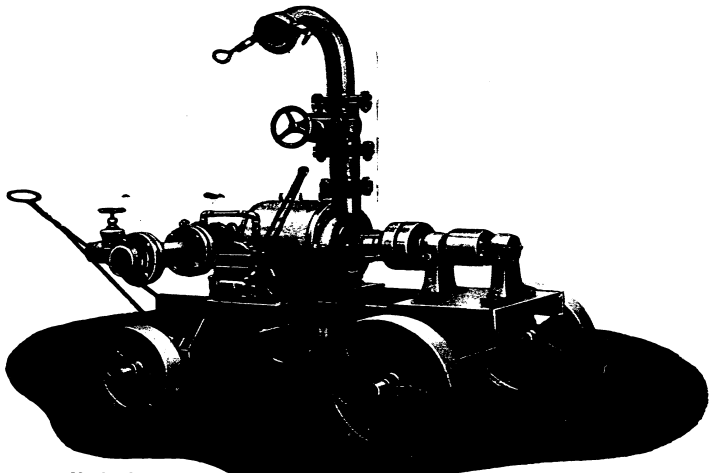
## TECHNICAL DATA OF STANDARD I. C. ENGINE-DRIVEN IRRIGATION PUMPS

| Type of Pumping Unit | Engine | Kind of Drive | Dia. of Branches (inches) | | Capacity | | Delivery Head | | Pump Type | Engine | | Method of Transport |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Suction | Discharge | l/min | Imp. G. P. M. | m | ft | | Output B. H. P. | Speed R. P. M. | |
| "IRIPA-5D" | Diesel | Belt | 2 | 2 | 200 | 44 | 43 | 140 | "HA 3a" | 5 | 900 | Four-wheeled Truck |
| "IRIWI"-4" | Petrol or Kerosene | Directly Coupled | 2½ | 2½ | 300 | 66 | 35 | 115 | "HL 4 | 4 | 2000 | Two-wheeled Truck |
| "IRIPA-8D" | Diesel | Belt | | | 450 | 100 | 43 | 140 | | 8 | 800 | Four-wheeled Truck |
| "IRILO-7" | | Directly Coupled | 3 | 3 | 600 | 130 | 30 | 98 | "HL 5" | 7 | 1300 | |
| "IRIPA-10" | | | | | 690 | 130 | 42 | 138 | | 10 | 1500 | |
| "IRIPA-12D" | | Belt | 2½ | 2½ | 650 | 143 | 40 | 130 | "HL 4" | 12 | 700 | |
| "IRIPA-15D" | | | 3 | 3 | 1000 | 220 | 41 | 135 | "HL 5" | 15 | 650 | |
| "IRIPA-27" | | Directly Coupled | 4 | 4 | 1500 | 330 | 55 | 180 | "HL 6" | 27 | 1500 | |

No 21. Irrigation pump "NA-4a-R" for belt drive.

## PRIMING

Larger irrigation pumping sets are recommended to be supplied with an air priming pump, which enables easy and rapid priming of the suction line. Our semi-rotary wing-pumps or "MOSTAR" and "LILA" Piston-Pumps, directly fitted on to the pump or steel frame of the unit, are used to great advantage for this purpose.



No 22. Irrigation pump [illegible] equipped with "MOSTAR" airpriming pump and "T"-piece for liquid manuring.



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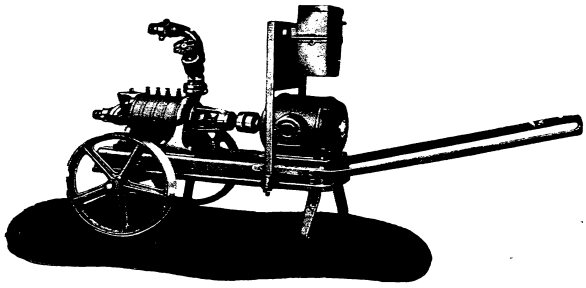
# *Pumps for Irrigation*

## GENERAL

For thorough and economical irrigation the selection of the most suitable type of pump is of the highest importance. The wide range of our "N", "H", and "V" Series of Centrifugal Pumps have proved themselves to be the most satisfactory for irrigation purposes. They are of strong, but simple construction, with bearings, shaft, impellers, etc. of excellent design, with only the highest quality materials being employed in their production. The prime movers, supplied with the pumps, may be electric, diesel, petrol, or kerosene. Electric motors, of modern design, are normally supplied, the insulation of the winding being proofed against moist atmospheric conditions. Closed motors, motors for abnormal voltage, and motors for direct current, will be quoted for on demand. They will satisfy all requirements, even under the most difficult working conditions. We supply standard sizes of centrifugal pumping units suitable for corresponding sizes of "REVOLT" spray-lines, garden sprinklers and "ROT-REVOLT" rotary rainers. The pumps have either cast iron or bronze impellers, and are capable of handling water, containing a high percentage of impurities, such as river water, diluted liquid manure etc.

Every pumping unit with the exception of "SIGVERTA 1" is equipped with a discharge bend ("TO-E"), complete suction and discharge screw connections for hose (the discharge up to 2" is with screw connection, and over 2" with Express coupling)

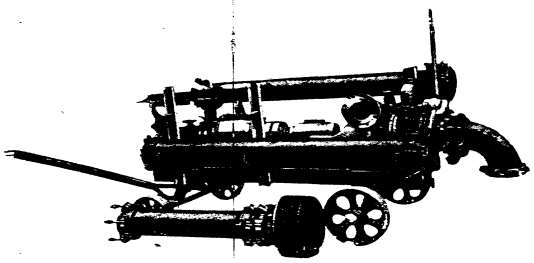


No 17. "SZE" irrigation pump with electric motor.

## ELECTRICALLY-DRIVEN IRRIGATION UNITS

The "SZE" standard irrigation unit comprises an irrigation pump (either "V" or "H" Series), and an electric motor and starter, mounted on a hand-propelled two-wheeled truck.

Outputs range from 50-200 l/min (10-44 Imp. G. P. M.), and are, therefore, suitable for small irrigation schemes.



No 18. "RZE" irrigation pump with electric motor on four-wheeled truck.

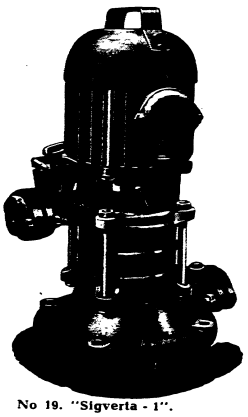
The "RZE" standard irrigation unit comprises an irrigation pump (either "H" or "N" Series), and an electric motor and starter, mounted on a hand-propelled four-wheeled truck.

The electric motor and starter are normally supplied with a box type cover, but, if desired, a top metal sheeting cover may be substituted (order symbol "RZE-K"). Outputs range from 250-800 l/min (55-180 Imp. G. P. M.) and are suitable for extensive irrigation schemes.

The "SIGVERTA 1" standard irrigation unit is of vertical design, with the pump directly flanged to the electric motor. The unit is portable, and is very stable because of its solid base. It can also be bolted in a stationary position. The bronze impellers are keyed to the shaft, which is common to the pump and motor. The pump is of high-pressure "V" Series type. This unit is ideal for garden use, because of its narrow construction, and easy portability.

## TECHNICAL DATA OF STANDARD ELECTRICALLY-DRIVEN "SZE" AND "RZE" IRRIGATION PUMPS

| Type | | Dia. of Suction and Discharge Branches in ins | Capacity | | Delivery Head | | Input B. H. P. | Pump | Three-phase Electric Motor Speed 2800 R.P.M. | | Voltage | Method of Transport |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | l/min | Imp. G. P. M. | metres | feet | | | B. H. P. | Design | | |
| "SIGVERTA 1" | | 1¼ | 60—90 | 13—20 | 30—21 | 100—70 | 0,85 | — | 1 | Squirrel cage | 380/220 V Freguency 50 cycles/sec. | Portable |
| "RZE" | "PROSPERA I" | 1¼ | 50 | 11 | 29 | 95 | 0,81 | VL 1, III-K | 1 | | | Two-wheeled Truck |
| | "PROSPERA II" | | 100 | 22 | 26 | 85 | 1,14 | VN 1/III-K | 1,5 | | | |
| | "PROSPERA III" | 1½ | | | 35 | 115 | 1,52 | VN1/IV-K | 2 | | | |
| | "STAR I" | | | | 40 | 132 | 2 | | | | | |
| | "STAR II" | | 150 | 33 | 36 | 118 | 2,5 | HA 2a | 4 | | | |
| | "PLUVIA II" | | 200 | 44 | 33 | 115 | 3 | | | | | |
| | "PLUVIA III" | | | | 40 | 132 | 4,4 | HA 3a | 6 | | | |
| "SZE" | "ATLANTA I" | 2 | 250 | 55 | 55 | 180 | 6 | | | Squirrel cage with star-delta-starter | | Four-wheeled Truck with Box Cover over Electric Motor and Starter |
| | "ATLANTA II" | | 300 | 66 | 50 | 164 | 6,3 | HL 3 | 7,5 | | | |
| | "ATLANTA III" | | 350 | 77 | 40 | 132 | 6 | | | | | |
| | "OCEAN I" | | | | 47 | 154 | 7 | | | | | |
| | "OCEAN II" | | 450 | | 50 | 164 | 8,5 | HL 4 | 10 | | | |
| | "MODERNA I" | 2½ | 500 | 110 | 37 | 122 | 6,5 | HA4a | | | | |
| | "MODERNA II" | | 600 | 132 | 37 | 122 | 7,7 | | 12 | | | |
| | "TRITONA I" | | 700 | 154 | 55 | 180 | 15 | HL 4 | 17,5 | Slipring with oil starter | | |
| | "TRITONA II" | | 800 | 176 | 42 | 148 | 15,5 | | | | | |



No 19. "Sigverta - 1".



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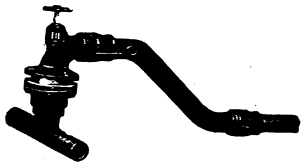
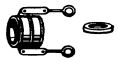
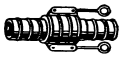
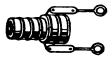
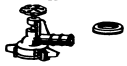
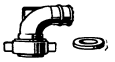
No 14. Self-closing hydrant "SHD-H" and "SHD-K".

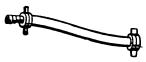
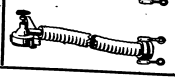
No 15. Hydrant top "SHUD", with two Express coupling connections, and with two connecting "SHE" necks.



No 16. Hydrant top "SHU", with Express coupling on one side and with connecting "SHE"-neck.

## LIST OF COMPONENTS FOR EXPRESS COUPLINGS, PIPE LINES, AND SELF-CLOSING HYDRANTS etc.

| Part | Order Symbol | Description |
|---|---|---|
| | "EXP" | Express coupling pair for piping |
|  | "EXT"<br>"EXG" | Express coupling, female half<br>Express coupling-packing ring |
| | "EXO" | Express coupling, male half |
| | "EXK" | Express coupling-stopper |
|  | "EPN" | Express coupling, pair with toils for hose connection |
|  | "ETN" | Express coupling, female half, with tail |
| | "EON" | Express coupling, male half, with tail |
| | "SHK-D" | Self-closing hydrant-body |
|  | "SHK-K"<br>"SHK-T" | Self-closing hydrant-top<br>Self-closing hydrant-packing ring |
| | "SHU" | Hydrant-top with Express coupling |
| | "SHUD" | Hydrant-top with two Express couplings |
| | "SHD-H" | Self-closing hydrant, brass body (smaller sizes) |
|  | "SHD-K"<br>"SHD-T" | Self-closing hydrant, brass top<br>Self-closing hydrant, packing ring |
| | "SHE" | Connecting neck with Express coupling |
| | "EXT" | Pipe-line with Express coupling fitted - length of 6 m (20 ft) |
| | "EXH" | Pipe-line with Express coupling and self-closing hydrant-body - length of 6 m (20 ft) |

| Part | Order Symbol | Description |
|---|---|---|
| | "EXTH" | T-piece with Express coupling and self-closing hydrant body - length approx. 0,5 m (1'8") |
| | "OE 45" | Bend with Express coupling 45° |
| | "OE 90" | Bend with Express coupling 90° |
| | "OO-E" | Branch-piece with Express coupling |
| | "DR-E" | Double branch-piece with Express couplings |
| | "KK-E" | Cross-piece with Express couplings |
| | "TO-E" | Discharge bend with Express coupling and flange for pump |
| | "OP 45" | Bend with flanges 45° |
| | "OP 90" | Bend with flanges 90° |
| | "OO-P" | Branch-piece with flanges |
| | "DR-P" | Double branch-piece with flanges |
| | "KK-P" | Cross-piece with flanges |
| | "SHH" | Connecting suction hose, 1 m in length (3 ft), with brass screw connections |
|  | "HHH" | Connecting hose, 2 m in length (6 ft), with brass screw connections |
| | "HEE" | Connecting hose, 2 m in length (6 ft), with Express coupling |
|  | "HKE" | Connection hose, 2 m in length (6 ft) with top of self-closing hydrant and Connection hose, 2 m in length (6 ft), |



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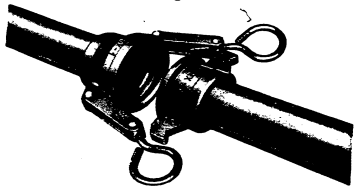
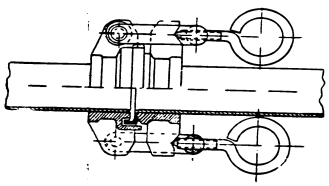
# *Pipe lines and fittings*

Permanent underground pipe line installations may be laid on the irrigation site, but light weight, easily transportable, steel tubes laid above ground are generally used. The latter are more economical, and have the advantage of easy transference wherever required. They are supplied in standard lengths of 6 m (20 ft), and are fitted with Express couplings.

With the use of Express Coupling, pipe lines and fittings, our overhead irrigation is made very flexible and adaptable. The pipe line direction or the branching off may easily be arranged for any point, and the rainers may easily be connected or disconnected.



**No 9. Open pipe joint with Express coupling.**

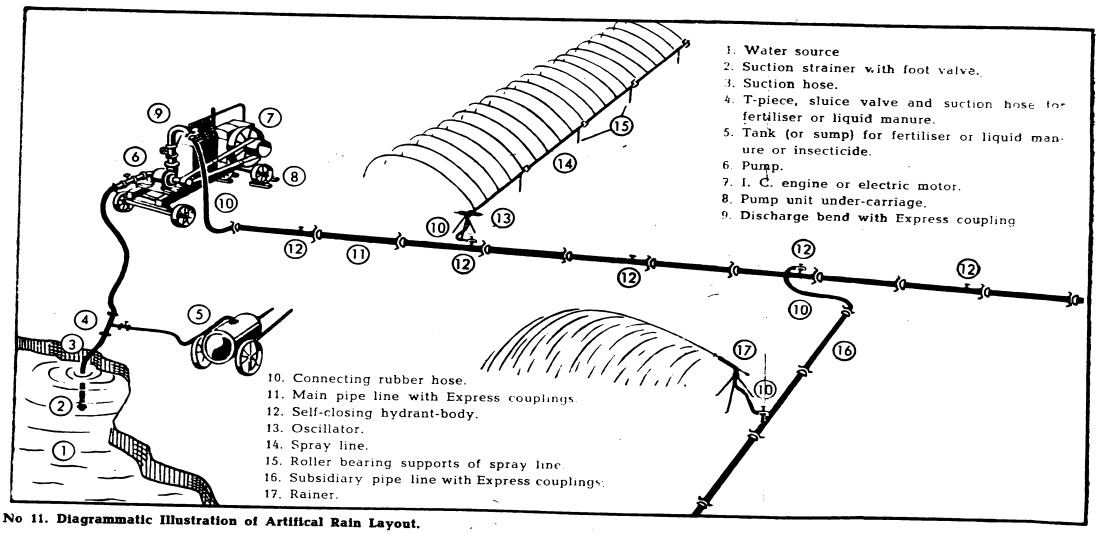


**No 10. Section of Express coupling.**

## TABLE OF STANDARD SIZES OF LIGHT WEIGHT PIPING

| Type | | Supplied in diameters of | | | | | | | in lengths |
|---|---|---|---|---|---|---|---|---|---|
| Pipes with Express couplings " XT" | mm | 45×42 | 55×52 | 76×73 | 88×84 | 102×98 | 129×125 | 155×151 | 6 m |
| | ins | $1^{25}/_{32}\times1^{21}/_{32}$ | $2^{1}/_{8}\times2$ | $3\times2^{1}/_{8}$ | $3^{1}/_{2}\times3^{11}/_{32}$ | $4\times3^{27}/_{32}$ | $5\times4^{27}/_{32}$ | $6^{1}/_{8}\times5^{29}/_{32}$ | |
| Pipes with flanges | mm | 45×42 | 55×52 | 76×73 | 88×84 | 102×98 | — | — | 70 ft |
| | ins | $1^{25}/_{32}\times1^{21}/_{32}$ | $2^{1}/_{8}\times2$ | $3\times2^{1}/_{8}$ | $3^{1}/_{2}\times3^{11}/_{32}$ | $4\times3^{27}/_{32}$ | — | — | |

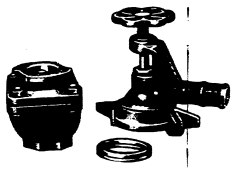
For smaller diameters we employ standard steel-drawn pipes.


1. Water source
2. Suction strainer with foot valve.
3. Suction hose.
4. T-piece, sluice valve and suction hose for fertiliser or liquid manure.
5. Tank (or sump) for fertiliser or liquid manure or insecticide.
6. Pump.
7. I. C. engine or electric motor.
8. Pump unit under-carriage.
9. Discharge bend with Express coupling
10. Connecting rubber hose.
11. Main pipe line with Express couplings
12. Self-closing hydrant-body.
13. Oscillator.
14. Spray line.
15. Roller bearing supports of spray line
16. Subsidiary pipe line with Express couplings.
17. Rainer.

**No 11. Diagrammatic Illustration of Artifical Rain Layout.**

## SELF-CLOSING HYDRANTS

These hydrants are of especial value in more extensive irrigation schemes, but can also be used to advantage where the rainers are to be transferred from one position to another. They enable rapid and easy disconnection of the rainer from the pipe-line. The top of the hydrant, e. g. connected with the hose of the rainer, is instantaneously coupled to the hydrant body. The hydrant body may either be fitted to the T-piece, equipped with Express couplings, or may be screwed on the nipple welded to the pine-line.



**No 12. Self-closing "SHK" Hydrant.**

**No 13. Self-closing "SHK" Hydrant screwed on the nipple, welded to the pipe-line.**



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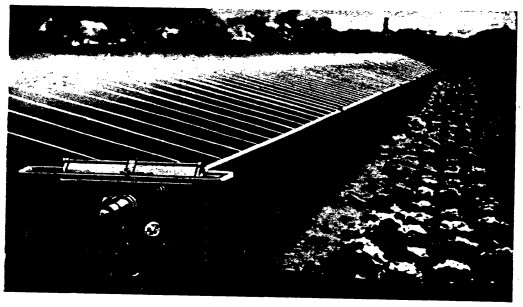
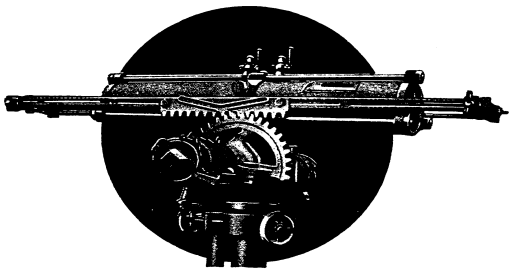
# "Revolt" Spray-line Rainers

Spray-line Rainers are designed in 4 sizes (see table), and the water emitted from the oscillating spray-lines is the nearest approach to rain, and is especially suitable for young or tender plants, flowers and early crops etc. Special advantages to be gained in the use of the "REVOLT" spray line are as follows:

1. The regulary spaced nozzles on the spray-lines provide a uniform, fine spray.
2. Although the "REVOLT" system works reliably at a pressure of 2.5—3 atm. (37—44 lbs per sq. in.), it can operate at as low a pressure as 1.5 atm. (22 lbs per sq. in.).
3. It is possible to connect the "REVOLT" to the main water supply, if there is no water supply available at site.
4. The fine spray, while in the air, absorbs the warmth of the atmosphere, which is very important when irrigating young or tender plants.
5. The regular movement of the spray-line is automatically controlled by an oscillator, which is hydraulically operated by the water supplied to the spray-line.
6. The "REVOLT" spray-line consists of sections of light galvanised steel pipes, and can, therefore, be easily and rapidly moved to a new position.



No 6. "REVOLT" Spray-line Rainer in operation.



No 7. "REVOLT" oscillator.

## GENERAL DESCRIPTION

The "REVOLT" spray-line rainer consists of an oscillator (either with one spray-line connection, or two lines, one on each side), 5 m (16 ft) standard length of piping, (with precisely machined nozzles), joined by means of instantaneous couplings and supported on roller-bearer supports. The oscillator stands on a tripod. If the double

No 8. Fine mist spray effected by "REVOLT" in a glass-house.

connection spray-line oscillator is used, the water supply is equally divided on either side, and, therefore, piping of smaller diameter is supplied. Thus this arrangement is less expensive.

The question of the use of the spray-line on one or both sides of the oscillator depends on the location of the source of water supply, and that of the irrigation site.

## TECHNICAL DATA OF "REVOLT" SPRAY-LINE RAINERS

| Type | | "NORMAL" | "STANDARD" | "SUPER" | "GRAND" |
|---|---|---|---|---|---|
| "RAINFALL" per hour | mm<br>ins | 6,4<br>0,25 | 9,5<br>0,37 | 14,5<br>0,57 | 22<br>0,86 |
| Consumption of water per 1 meter (3 ft) of spray-line in | l/min.<br>Imp<br>G.P.M. | 1,6<br>1/3 | 2,4<br>1/2 | 3,7<br>3/4 | 5,5<br>1 1/4 |
| Number of nozzles per 5 m (16 ft) length of spray-line | | 13 | 13 | 20 | 20 |
| Total width irrigated | m<br>ft | 15<br>50 | | | |
| Max. length of spray-line "UDE" | m<br>ft | 100<br>330 | 100<br>330 | 100<br>330 | 80<br>260 |
| Max. length of spray-line "UDD" | m<br>ft | 100<br>330 | | | |

## NOTE

"REVOLT-UDE" signifies unit with spray-line on one side of oscillator,
"REVOLT-UDD" signifies unit with spray-line on both sides of oscillator.
We can also quote for "REVOLT" units suitable for glass-houses and hot-beds. (See illustration.)



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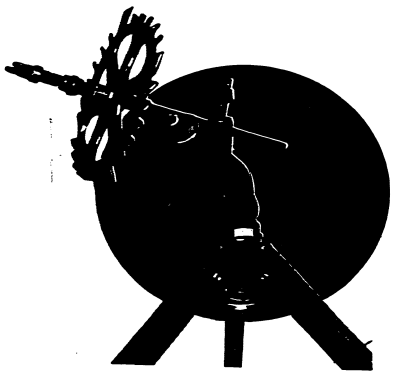
## "REVOLTIN"

This is a small-type rotary sprinkler. The spray is formed by the water jet striking the spinning wheel, and the rotation of the sprinkler is caused by the back pressure of the water.
The nozzle, body, and hose coupling are made of brass; the spinning wheel of aluminium, and the spinning wheel rod of steel.
The nozzle can be fitted in various sizes (see Table).



No 6. "REVOLTIN" Garden Sprinkler.

## "ROT-REVOLT I-P"

This sprinkler is suitable for garden irrigation, but may also be used to advantage in small fields.
It is a rotary sprinkler, and the design is exactly similar to that of the "ROT-REVOLT 2-P and 3-P" described above.

## TECHNICAL DATA OF GARDEN SPRINKLERS

**(These data apply to calm atmospheric conditions)**

| Use | Type | Diameter of Nozzle mm | Nozzle ins | Hose connections ins | Capacity l/min | Capacity Imp. G.P.M. | Pressure atm | Pressure lbs./sq. in. | Length of jet m | Length of jet feet | "Rainfall" per hour mm | "Rainfall" per hour ins | Area covered $m^2$ | Area covered sq. feet | Symbol |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Garden irrigation | "SILVER JET" | | | 1/2—3/4 | 20—50 | 4—11 | 1—2,5 | 14—35 | 5 | 16 | 3—4 | 0,14 | 78 | 840 | "SD 1" |
| | | | | 1 | 50—100 | 11—22 | 2—2,5 | 28—35 | 7 | 23 | 3—5 | 0,16 | 154 | 1660 | "SD 2" |
| | "REVOLTIN" | 4 | 5/32 | 3/4 | 14,3 | 3 | 2 | 28 | 9 | 30 | 3,4 | 0,13 | 254 | 2735 | "RT" |
| | | | | | 17,5 | 4 | 3 | 43 | 10,5 | 34 | 2,9 | 0,11 | 346 | 3730 | |
| | | | | | 20,3 | 4 1/2 | 4 | 57 | 12 | 40 | 2,7 | 0,1 | 450 | 4850 | |
| | | 5,5 | 7/32 | | 26,3 | 6 | 2 | 28 | 10 | 33 | 5 | 0,2 | 314 | 3385 | |
| | | | | | 32,3 | 7 | 3 | 43 | 12 | 40 | 4,2 | 0,16 | 450 | 4850 | |
| | | | | | 38 | 8 1/2 | 4 | 57 | 14 | 46 | 3,7 | 0,14 | 615 | 6630 | |
| | | 7 | 9/32 | 1 | 43,8 | 9 1/2 | 2 | 28 | 11 | 36 | 6,6 | 0,26 | 380 | 4080 | |
| | | | | | 53,5 | 12 | 3 | 43 | 13,5 | 44 | 5,6 | 0,22 | 570 | 6140 | |
| | | | | | 61 | 13 1/2 | 4 | 57 | 14 | 46 | 4,6 | 0,18 | 804 | 8660 | |
| | "ROT-REVOLT 1-P" | 8,5 | 5/16 | 1 1/4 | 61,5 | 13 1/2 | 2 | 28 | 15 | 50 | 5,2 | 0,2 | 706 | 7620 | "RR 1-P" |
| | | | | | 78 | 17 | 3 | 43 | 18 | 60 | 4,6 | 0,18 | 1017 | 10880 | |
| | | | | | 90 | 20 | 4 | 57 | 20 | 66 | 4,4 | 0,17 | 1256 | 13520 | |
| | | | | | 100 | 22 | 5 | 72 | 22,5 | 74 | 3,7 | 0,14 | 1590 | 17120 | |
| | | 10* | 3/8 | | 87,5 | 19 | 2 | 28 | 16 | 52 | 6,5 | 0,25 | 800 | 8620 | |
| | | | | | 108 | 24 | 3 | 43 | 19,5 | 64 | 5,4 | 0,21 | 1190 | 12820 | |
| | | | | | 123 | 27 | 4 | 57 | 22 | 72 | 4,8 | 0,19 | 1520 | 16370 | |
| | | | | | 140 | 31 | 5 | 72 | 24 | 80 | 4,6 | 0,18 | 1810 | 19420 | |
| | | 12* | 1/2 | 1 1/2 | 127 | 28 | 2 | 28 | 17 | 56 | 8,4 | 0,33 | 907 | 9710 | |
| | | | | | 157 | 34 1/2 | 3 | 43 | 20,5 | 67 | 7,1 | 0,28 | 1320 | 14150 | |
| | | | | | 182 | 40 | 4 | 57 | 23 | 76 | 6,5 | 0,25 | 1660 | 17800 | |
| | | | | | 204 | 45 | 5 | 72 | 25 | 82 | 6,2 | 0,24 | 1960 | 21040 | |

* "RR 1-P" with these nozzles may be used for field irrigation (smaller areas).



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No 3. "SILVER JET" in operation.

# *Garden Sprinklers*

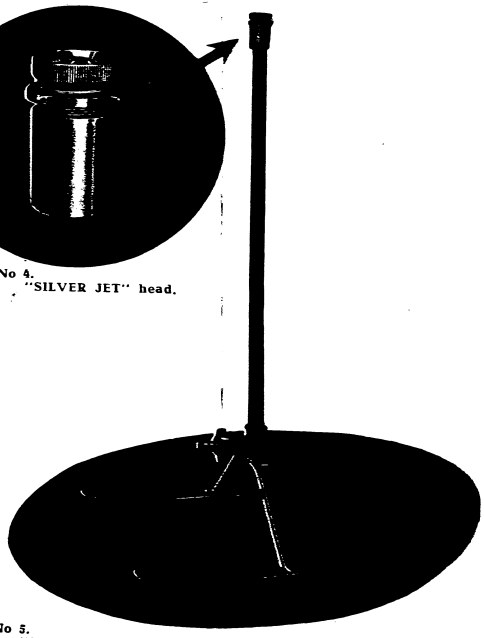
No 4.
"SILVER JET" head.

These sprinklers are mostly used for the irrigation of gardens, lawns, golf-greens, tennis courts etc. They are light in weight and easily transportable, and can be connected either to the main water supply, or operated by means of a small pump.
All types of garden sprinklers work automatically, and are reliable in operation. They produce a fine spray curtain, uniformly distributed.

The standard types are as follows:

## "SILVER JET"

This is the simplest design of sprinkler manufactured by us. It comprises a vertical tube on a stand. The equaliser in the jet head ensures a fine spray mist, the diameter of which may be adjusted as required. The jet head is nickel-plated. The screw connection for the hose is of ¾" or 1" diameter. We can supply the jet head only, for connection to piping of ¾" or 1" diameter (see illustration).



No 5.
"SILVER JET" complete.



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# TECHNICAL DATA OF "ROT-REVOLT" LONG RANGE FIELD ROTARY RAINERS

**(These data apply to calm atmospheric conditions)**

| Use | Type | Diameter of Nozzle mm | Diameter of Nozzle ins | Hose connections ins | Capacity l/min | Capacity Imp. G.P.M. | Pressure atm | Pressure lbs/sq. in | Length of jet m | Length of jet feet | "Rainfall" per hour mm | "Rainfall" per hour ins | Area covered $m^2$ | Area covered acres | Symbol |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Field Irrigation | "ROT-REVOLT 2" | 14 | 9/16 | 2 | 174 | 38 | 2 | 28 | 19 | 62 | 9,2 | 0,36 | 1130 | 0,28 | "RR 2-P" "RR 2-K" |
| | | | | | 215 | 47 | 3 | 43 | 24 | 78 | 7,2 | 0,28 | 1810 | 0,45 | |
| | | | | | 250 | 55 | 4 | 57 | 26,5 | 87 | 6,8 | 0,27 | 2200 | 0,54 | |
| | | | | | 275 | 60 | 5 | 72 | 28 | 92 | 6,7 | 0,26 | 2460 | 0,61 | |
| | | | | | 300 | 66 | 6 | 86 | 29 | 95 | 6,6 | 0,26 | 2640 | 0,65 | |
| | | 16 | 5/8 | | 227 | 50 | 2 | 28 | 20 | 66 | 10,8 | 0,42 | 1250 | 0,31 | |
| | | | | | 277 | 61 | 3 | 43 | 25,5 | 84 | 6,8 | 0,27 | 2040 | 0,50 | |
| | | | | | 322 | 71 | 4 | 57 | 29 | 95 | 7,2 | 0,28 | 2640 | 0,65 | |
| | | | | | 360 | 79 | 5 | 72 | 31 | 102 | 7,1 | 0,28 | 3020 | 0,75 | |
| | | | | | 390 | 86 | 6 | 86 | 32,5 | 107 | 7 | 0,27 | 3320 | 0,82 | |
| | | 18 | 11/16 | 2 1/2 | 282 | 62 | 2 | 28 | 21 | 69 | 12,4 | 0,49 | 1885 | 0,46 | |
| | | | | | 348 | 76 | 3 | 43 | 27 | 88 | 9,1 | 0,36 | 2290 | 0,56 | |
| | | | | | 402 | 88 | 4 | 57 | 31 | 102 | 7,6 | 0,30 | 3020 | 0,75 | |
| | | | | | 455 | 100 | 5 | 72 | 33,5 | 110 | 7,7 | 0,30 | 3525 | 0,87 | |
| | | | | | 495 | 109 | 6 | 86 | 35,5 | 117 | 7,5 | 0,29 | 3960 | 0,98 | |
| | "ROT-REVOLT 3" | 20 | 13/16 | 2 1/2 | 438 | 96 | 3 | 43 | 31,5 | 104 | 8,4 | 0,33 | 3110 | 0,77 | "RR 3-P" "RR 3-K" |
| | | | | | 500 | 110 | 4 | 57 | 36,5 | 120 | 7,1 | 0,28 | 4185 | 1,03 | |
| | | | | | 560 | 123 | 5 | 72 | 39 | 128 | 7 | 0,28 | 4770 | 1,18 | |
| | | | | | 620 | 136 | 6 | 86 | 40 | 132 | 7,4 | 0,29 | 5020 | 1,23 | |
| | | 22 | 7/8 | 3 | 530 | 116 | 3 | 43 | 33 | 108 | 9,3 | 0,36 | 3420 | 0,84 | |
| | | | | | 610 | 134 | 4 | 57 | 38,5 | 126 | 7,8 | 0,31 | 4650 | 1,15 | |
| | | | | | 680 | 150 | 5 | 72 | 41,5 | 136 | 7,5 | 0,29 | 5410 | 1,33 | |
| | | | | | 745 | 164 | 6 | 86 | 43 | 141 | 7,7 | 0,30 | 5810 | 1,43 | |
| | | 24 | 15/16 | | 630 | 138 | 3 | 43 | 34,5 | 113 | 10,3 | 0,40 | 3740 | 0,92 | |
| | | | | | 720 | 158 | 4 | 57 | 40,5 | 133 | 8,4 | 0,33 | 5150 | 1,27 | |
| | | | | | 820 | 180 | 5 | 72 | 44 | 144 | 8 | 0,31 | 6080 | 1,50 | |
| | | | | | 885 | 105 | 6 | 86 | 45,5 | 150 | 8,1 | 0,32 | 6500 | 1,60 | |
| | "ROT-REVOLT 4" | 26 | 1 | 4 | 730 | 160 | 3 | 43 | 36 | 118 | 10,8 | 0,42 | 4070 | 1,00 | "RR 4-P" "RR 4-K" |
| | | | | | 846 | 186 | 4 | 57 | 42 | 138 | 9,1 | 0,36 | 5540 | 1,37 | |
| | | | | | 945 | 208 | 5 | 72 | 46 | 150 | 8,5 | 0,33 | 6640 | 1,64 | |
| | | | | | 1030 | 227 | 6 | 86 | 48 | 158 | 8,5 | 0,33 | 7230 | 1,79 | |
| | | | | | 1110 | 244 | 7 | 100 | 49 | 160 | 8,8 | 0,35 | 7540 | 1,86 | |
| | | 30 | 1 3/16 | | 980 | 216 | 3 | 43 | 37,5 | 123 | 13,7 | 0,54 | 4410 | 1,09 | |
| | | | | | 1120 | 246 | 4 | 57 | 44 | 145 | 11 | 0,43 | 6080 | 1,50 | |
| | | | | | 1250 | 275 | 5 | 72 | 48,5 | 160 | 10,3 | 0,41 | 7390 | 1,82 | |
| | | | | | 1380 | 304 | 6 | 86 | 51 | 168 | 10,2 | 0,40 | 8170 | 2,02 | |
| | | | | | 1510 | 332 | 7 | 100 | 52,5 | 172 | 10,5 | 0,41 | 8660 | 2,14 | |
| | | 35 | 1 3/8 | | 1330 | 293 | 3 | 43 | 39 | 128 | 16,8 | 0,66 | 4770 | 1,17 | |
| | | | | | 1520 | 335 | 4 | 57 | 46 | 150 | 13,7 | 0,54 | 6640 | 1,64 | |
| | | | | | 1720 | 378 | 5 | 72 | 51 | 168 | 12,4 | 0,49 | 8170 | 2,02 | |
| | | | | | 1880 | 414 | 6 | 86 | 54 | 178 | 12,4 | 0,49 | 9160 | 2,26 | |
| | | | | | 2020 | 445 | 7 | 100 | 56 | 184 | 12,6 | 0,50 | 9850 | 2,43 | |



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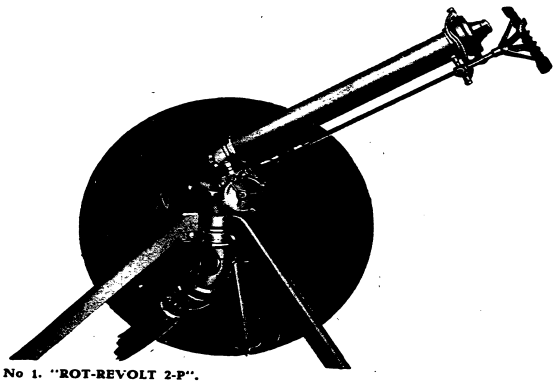
Artificial rain also ensures an earlier harvest of all kinds of market produce, such as, potatoes, cabbage, tomatoes, lettuce, strawberries etc. and thus enables the grower to sell his produce at the best prices and to prepare the ground for the next sowing, before the soil becomes too hard for easy working. Pasture land and animal-feed crops as well as golf-courses, tennis courts, lawns, gardens etc. benefit greatly by employing our artificial rain equipment at regular intervals. Fertilization and manuring of the soil can also be aided by such methods, because of the dilution of the chemicals, and their resultant penetration of the soil. We have had thirty years experience in the development and production of all types of irrigation equipment, and have evolved hundreds of irrigation schemes in all parts of the world. The experience thus gained is freely at the disposal of all prospective clients, who may wish to consult us about any irrigation scheme, large or small.
The extensive range of our irrigation units embodying all the most up to date improvements in design and construction, enables the grower to select the most suitable type, which will completely satisfy his individual needs. The scope of this leaflet covers only our standard equipment for artificial irrigation. In the case of special conditions and extensive irrigation schemes, we are prepared to offer separate quotations.

# *"Rot-Revolt" long range field rotary rainers*

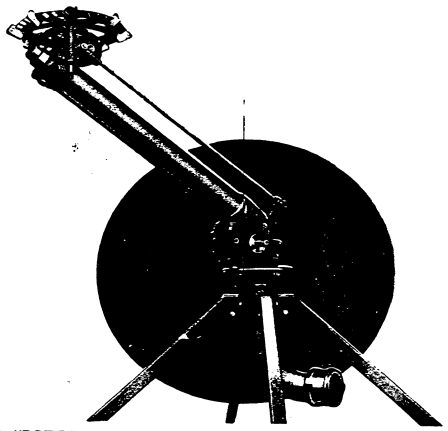
The succes of our "ROT-REVOLT" rainers is due to their excellence in design, the employment of only the best materials in their construction, and their unfailing reliability in operation. Hundreds of thousands of acres in many places of the world are today systematically irrigated by our units, which have proved indispensable to their users.

## GENERAL DESCRIPTION

"ROT-REVOLT" rainers are constructed of brass and bronze, are completely automatic in operation, and are easily transportable. The rotation seat is guided in a ball-bearing. Equalising tubes, inserted in the main body, stabilise the pressure water directed to the nozzle, thus ensuring the maximum "throw". The spinning wheel disturbs the water jet which is then transformed into a curtain of fine spray, which falls evenly over its whole length. The rainer is supported by a collapsible tripod, and for hose or other connection the unit is provided with a bend and half of Express coupling.
According to the design of the revolving mechanism, the "ROT-REVOLT" rainers comprise the following types:



No 1. "ROT-REVOLT 2-P".



No 2. "ROT-REVOLT 4-K".

### "ROT-REVOLT 2-P" AND "ROT-REVOLT 3-P"

These rainers rotate slowly. The revolving mechanism is operated by the water jet striking the spinning wheel, located in front of the nozzle. This in turn, actuates the worm and gear, situated on the rotation seat by means of a connecting spindle. A feature of these types is that they will pass dirty water or liquid manure.

### "ROT-REVOLT 2-K" AND "ROT-REVOLT 3-K"

The design of these rainers is similar to that of the "P" types. The only difference is that the rotating mechanism enables the unit to rotate either in a full circle (as in the "P" types), or in arcs of varying degrees.

### "ROT-REVOLT 4-K"

This design differs from the abovementioned types in that, that the worm and gear are located directly under the spinning wheel. The rotating mechanism, situated on the rotation seat, is operated by a connecting rod. This unit rotates either in a full circle, or in arcs of varying degrees. These rainers are for extensive schemes and for hardier crops. This type will also pass dirty water or liquid manure.



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Field Irrigation

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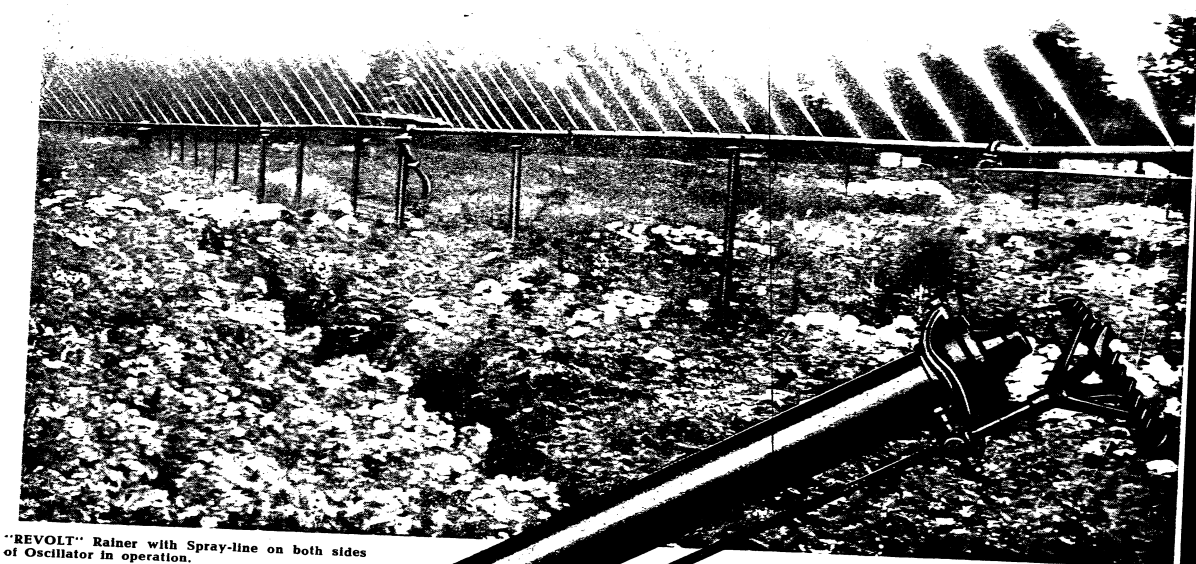
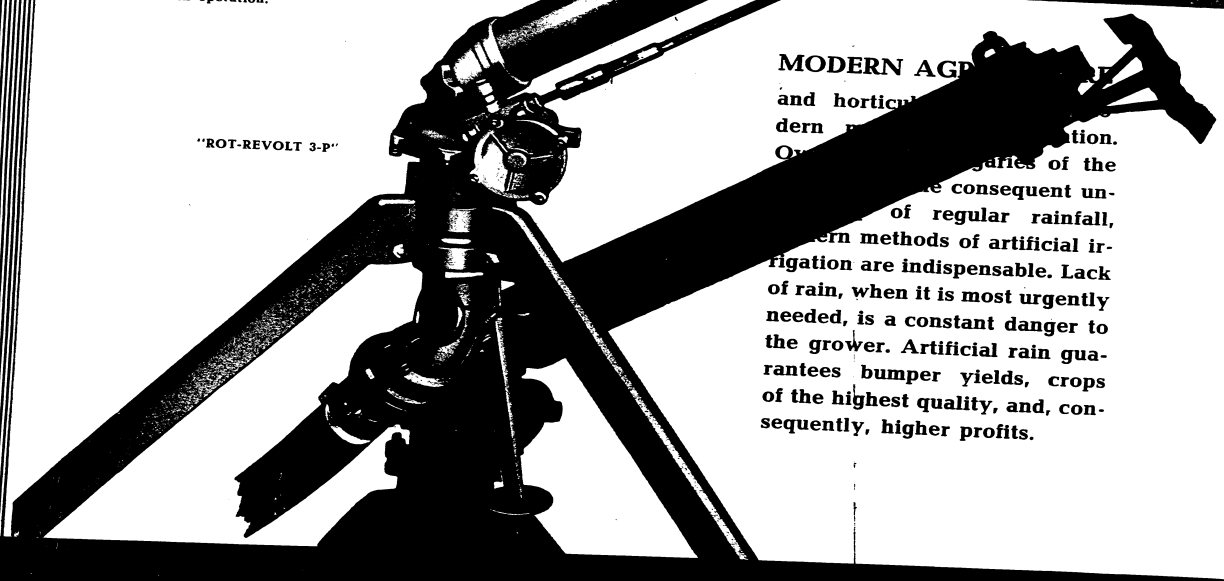
*Artificial*

# IRRIGATION



"REVOLT" Rainer with Spray-line on both sides of Oscillator in operation.



"ROT-REVOLT 3-P"

**MODERN AG[illegible]**

**and horticu[illegible] dern [illegible]tion. O[illegible]aries of the [illegible]e consequent un- [illegible] of regular rainfall, [illegible]ern methods of artificial irrigation are indispensable. Lack of rain, when it is most urgently needed, is a constant danger to the grower. Artificial rain guarantees bumper yields, crops of the highest quality, and, consequently, higher profits.**

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[redacted]

- The Type EBN LORENZ Diesel Engine is a stationary, horizontal, single-cylinder, four-stroke unit of latest design with fuel injection into a turbulence chamber. All moving parts are well lubricated and enclosed inside the crankcase thus being well protected against dust.
- THE CRANKCASE is made of cast iron and provided with side covers carrying the ball bearings of the crankshaft.
- THE CYLINDER LINER is exchangeable of the "wet" type and sealed at its bottom end with 2 rubber rings preventing the cooling water from entering into the bottom part of the crankcase.
- THE CYLINDER HEAD is removable and water cooled. The combustion chamber is arranged in the cylinder head and fuel is delivered into it by means of an injection pump and atomized by means of a pin type nozzle.
- THE CRANKSHAFT runs in ball bearings of generous size and the gudgeon pin is pressure lubricated. The lubrication is effected by means of piston oil pump of reliable design. Counterweights are bolted to the crankshaft arms.
- THE CONNECTING ROD is H-shaped and is die forged and has a split big end bearing lined with best grade bearing metal. The small end bearing is of bronze.
- THE CAMSHAFT has accurately machined cams and runs in ball bearings. The valve push rods are furnished with hardened and ground rollers. The valve springs are made of best grade material and carefully tested.
- THE PISTON is made of light weight metal and the gudgeon pin is hardened and ground.
- THE GOVERNOR manufactured with the greatest care is fitted with ball bearings ensuring a high sensitivity. The engine speed may be controlled by hand during operation of the engine.
- THE TWO FLYWHEELS ensure the most favourable degree of cyclic irregularity. The belt pulley is bolted to one of the flywheels.
- THE COOLING is by water (evaporating system).
- THE AIR CLEANER is of the "wet" type with an oil bath guaranteeing a thorough cleaning of air even in dusty localities.
- SOME OUTSTANDING FEATURES: When designing the LORENZ EBN Diesel engine the latest experiences and modern manufacturing methods were applied. All parts are manufactured to close limits so that easy replacement is ensured. The design of the crankcase permits easy dismantling and reassembling of the engine and affords easy access to all parts. The arrangement of cooling spaces ensures a minimum consumption of cooling water and a perfect cooling effect. The engine runs quite noiselessly without objectionable vibration, the starting is easy and reliable. By their low fuel consumption, small weight, high output, easy attendance and reliability LORENZ EBN Diesel engines rank among the best horizontal engines in the world.

**TECHNICAL DATA:**

| | |
|---|---|
| Engine output . . . | 7 H. P. at 1300 r. p. m<br>5 H. P. at 900 r. p. m |
| Bore . . . . . | 100 mm. ($3^{15}/_{16}$") |
| Stroke . . . . . | 130 mm. ($5^{1}/_{8}$") |
| Mean piston speed . . | 5.65 m/sec. (18'6" per sec.) |
| Compression ratio . . . . . | 1 : 13.5 |
| Compression pressure . . . . | 32 atms (455 psi) |
| Combustion pressure . . . . . | 52 atms (740 psi) |
| Overload capacity of engine | 10 per cent for 1 hour<br>or 20 per cent for 1 minute |

Fuel consumption:
210 gr (7,41 oz) per H. P. and hour at 100 per cent load,
217 gr (7,65 oz) per H. P. and hour at 75 per cent load,
238 gr (8,39 oz) per H. P. and hour at 50 per cent load,
with a tolerance of 5 per cent, with a lower calorific value of fuel of 10.750 calories (39,630 BTU) and a temperature of the cooling water of 100° C. (212° F). Lubricating oil consumption: 6 gr (0.20 oz) per H. P. and hour with a tolerance of 10 per cent.
Moment of inertia G $D^2$ . . . . . 13.56 kg $m^2$
Cyclic irregularity . . . . . 1 : 60

# STROJEXPORT

**PRAHA - CZECHOSLOVAKIA**

COK 53779 a — 5502

Printed in Czechoslovakia — Kn 02 - 3308-55

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# LORENZ DIESEL ENGINE TYPE EBN

Output 7 H. P. at 1300 r. p. m. Weight 267 kg (590 lbs.) Diameter of belt pulley 150 mm. (6″) Width of belt pulley 200 mm. (8″)

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[redacted]

The same standard equipment as listed under a) above for engines with hand starting plus the following additional items:

1 Air distributor (fitted to engine)
1 Starting cock (fitted to engine)
1 Air bottle, complete
1 Compressed air pipings

[redacted]

The same standard equipment as listed under a) above for engines with hand starting plus the following additional items:

1 Electric starter motor 24 Volts (fitted to engine)
1 Dynamo 24 Volts (fitted to engine)
1 Switch box (fitted to engine)
1 Relay (fitted to engine)
1 Pilot bulb (fitted to engine)
1 Battery 24 Volts in two cabinets of 12 Volts each

[redacted]

1. Bed plate for engine and driven machine
2. Bed plate, extended shaft, belt pulley and outside bearing
3. Bed plate, sliding coupling, extended shaft, belt pulley and outside bearing
4. Motor car type radiator and fan
5. Self priming pump.
6. Lubricating oil cooler (for tropical countries only)
7. Damp (oil) air conditioner (for specially dusty environs)
8. Foundation bolts
9. Fuel supply pump (fitted to injection pump)
10. Hand-operated air compressor
11. Elastic joint
12. Exhaust damper
13. Exhaust pipe
14. Remote control of motor
15. Other general machine-house equipmen:

The "Set of Spare Parts" supplied with the engine comprises:

1 Set of the most important gaskets
1 Set of springs
1 Set of the most important bolts and nuts,
piston rings, compression: 3 for ŠKODA 2S110
4 for ŠKODA 3S110
6 for ŠKODA 4S110
8 for ŠKODA 6S110
piston rings, scraper: 1 for ŠKODA 2S110
1 for ŠKODA 3S110
2 for ŠKODA 4S110
4 for ŠKODA 6S110

**STROJEXPORT** PRAHA - CZECHOSLOVAKIA

ČOK 52416 a - 5407

Printed in Czechoslovakia (Sčt 01-902-54)

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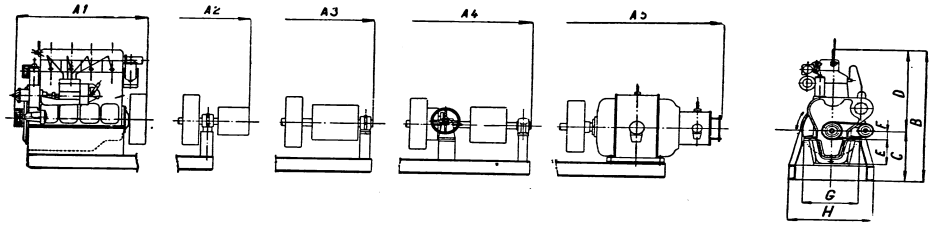
Diesel Engine wit

There are three sizes of flywheels for the ŠKODA-S110 engines. The standard flywheels and the corresponding cyclic irregularities are given in the dark area of the second table above.

The flywheels indicated in the light area serve, for instance, for the direct coupling of generators, compressors, pumps, etc.

In special cases engines are fitted with flywheels according to special calculations.

The direction of rotation is clockwise when viewed from the front, i. e. from the starting handle end.




[redacted]

| | $A_1$ | $A_2$ | $A_3$ | $A_4$ | $A_5$ | B | C | D | E | F | G | H |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 2S110 | 762 | 1212 | — | — | 1842 | 1312 | 482 | 830 | 196 | 80 | 480 | 730 |
| 3S110 | 962 | 1428 | — | — | 2089 | 1312 | 482 | 830 | 196 | 80 | 480 | 730 |
| 4S110 | 1160 | — | 1769 | 2066 | 2356 | 1312 | 482 | 830 | 246 | 80 | 480 | 730 |
| 6S110 | 1520 | — | 2129 | 2426 | 2907 | 1312 | 482 | 830 | 246 | 80 | 480 | 730 |

[redacted]

[redacted]

1 Standard flywheel (fitted to engine)
1 Centrifugal cooling water pump (fitted to engine)
1 Fuel tank for 8 hour operation
1 Fuel pipe 3 metres (10 feet) long
1 Fuel cleaner (fitted to engine)
1 Lubricating oil cleaner (fitted to engine)
1 Dry air cleaner (fitted to engine)
1 Oil pressure gauge (fitted to engine)
1 Starting handle
1 Set of spanners and tools
1 Tool box
1 Instruction book
1 Set of spare parts

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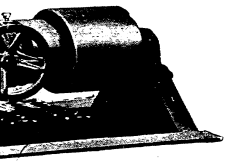
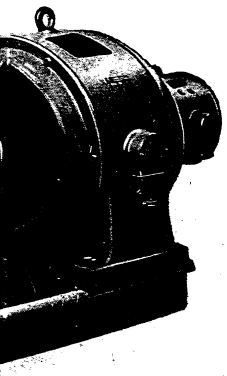
g coupling, extended



es, 400/231 Volt, with



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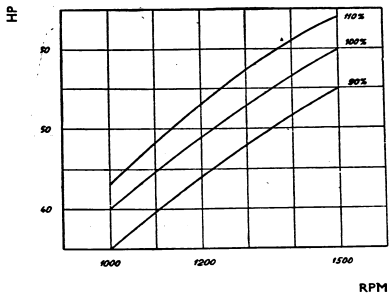
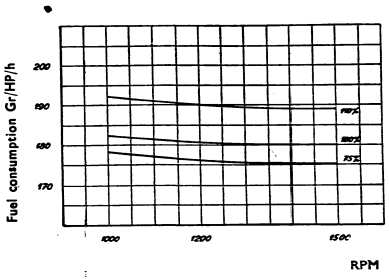
**Maximum, Rated and Continuous Performance Curves of Four Cylinder 4 S 110 Engine**




**Fuel Consumption Curves for Four Cylinder 4 S 110 Engine**




[redacted]

| At | 100% | 75% | 50% of rated output |
|---|---|---|---|
| grams per BHPh | 180 | 190 | 205 |
| lbs per BHPh | 0.397 | 0.419 | 0.452 |

subject to a tolerance of 5% when fuel is used of a suitable grade with a minimum calorific value of 10.750 kcal per kg (19,350 BTU per lb.).

[redacted]

At rated engine output oil consumption is 4 to 6 gr (HPh).0088 to .0132 lbs (HPh), subject to a tolerance of 10%. ŠKODA Diesel engines may be run on standard good quality fuel and lubricating oil commonly used for oil engines.
Each engine is tested in our works at rated load in the normal operating range and at overload and the obtained fuel and lubricating oil consumption figures are recorded and certified.

[redacted]

The quantity of cooling water required is about 15 litres (3,3 galls) per HPh at a rated output with a temperature rise of 40° C (104° F). The quantity of cooling water required increases and decreases proportionately to the varying water temperature rises. The temperature of discharged water must not exceed 80° C (190° F). If the hardness of the water exceeds 5 mg $CaCO_3$ in 100 $cm^3$ (3.5 grains per gallon) a water softening plant should be installed or indirect cooling applied. We supply suitable equipment at an extra charge.

[redacted]

| | | | |
|---|---|---|---|
| Bore | 110 mm 4 5/16″ | Injection pressure 150 kg/$cm^2$ | (2135 lb p. sq. in.) |
| Stroke | 150 mm 5 7/8″ | | |
| Compression pressure | 38 kg/$cm^2$ (540 lb p. sq. in.) | Temperature of exhaust gases at 100% load 400—460° C | (750—850° F) |
| Combustion presure | 65 kg/$cm^2$ (925 lb p. sq. in.) | Diameter of exhaust pipe 68 mm | 2 11/16″ |

[redacted]

| Size of fly-wheel | Dimensions C mm | C inches | D mm | D inches | Moment of inertia GD² kgm² | WR² lbs. sq. ft. | Weight of flywheel kg lbs |
|---|---|---|---|---|---|---|---|
| 1 | 150 | 6″ | 500 | 20″ | 21.7 | 0.122 | 136/300 |
| 2 | 150 | 6″ | 620 | 25″ | 41 | /0.231 | 150/331 |
| 3 | 130 | 5 1/8″ | 700 | 27″ | 64.7 | 0.365 | 197/435 |

| Type of engine | r. p. m. 1000 flywheel size 1 | 2 | 3 | 1500 1 | 2 |
|---|---|---|---|---|---|
| ŠKODA 2S110 | — | 1/100 | 1/155 | — | 1/220 |
| ŠKODA 3S110 | — | 1/110 | 1/175 | — | 1/246 |
| ŠKODA 4S110 | 1/200 | 1/380 | — | 1/450 | 1/855 |
| ŠKODA 6S110 | 1/230 | 1/425 | — | 1/510 | 1/955 |

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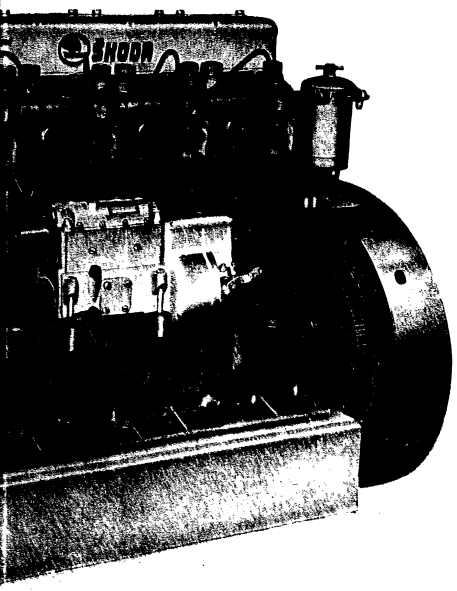
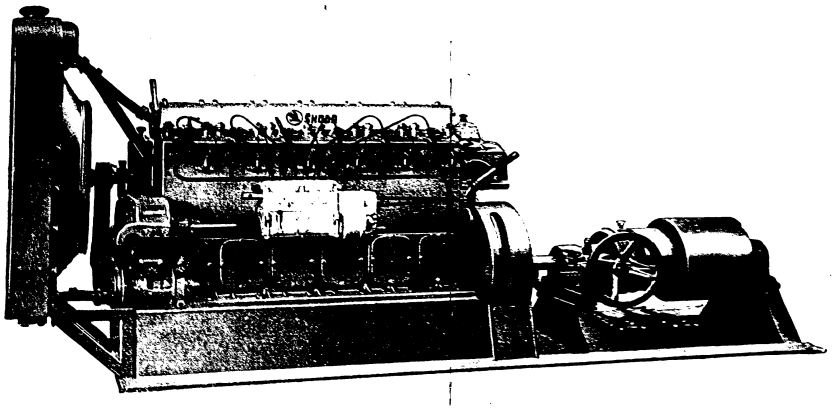
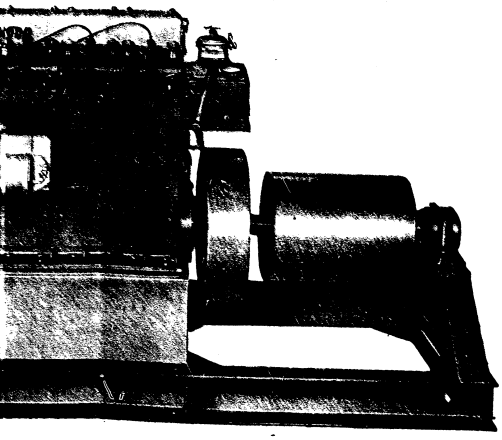
Diesel Engine with electric starting, standard design

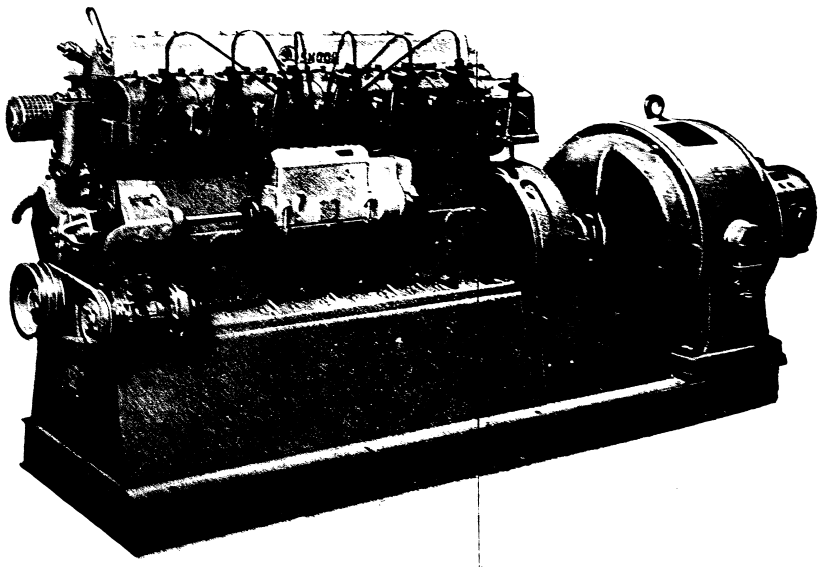


↓ ŠKODA 6S110 Diesel Engine with electric starting, special design with sliding coupling, extended shaft and outside bearing on common bed plate



↓ ŠKODA Diesel Engine generating set, 40 kW, 1000 r. p. m., 50 cycles, 400/231 Volt, with ŠKODA 6S110 engine





compressed air starting, special design with extended shaft, outside bearing on common bed plate

The photographs and dimension drawings are only approximate and we reserve the right to make alterations and improvements as necessary in the course of time

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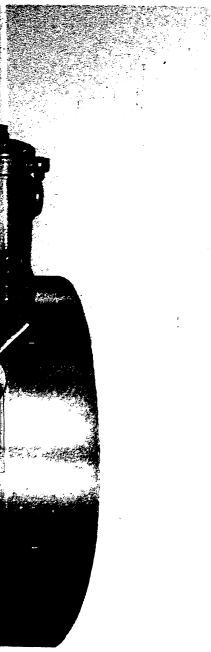
tandard design



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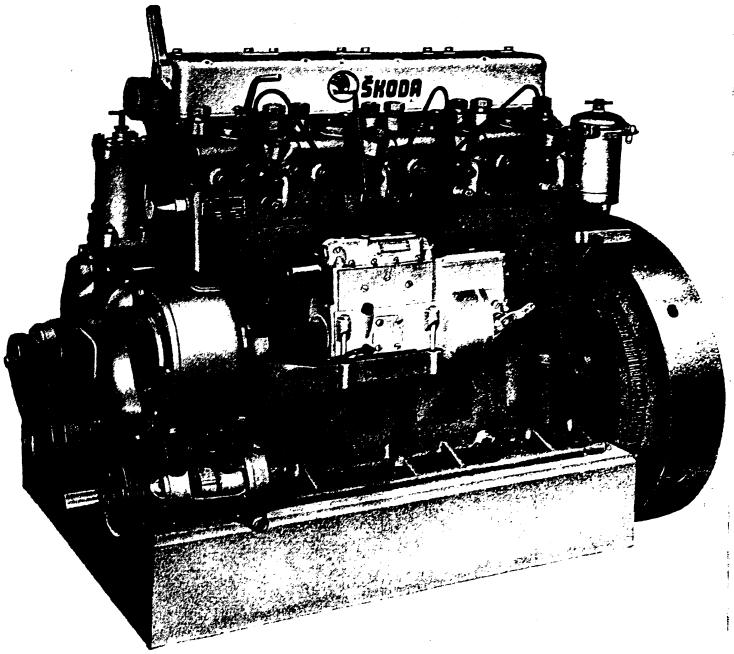
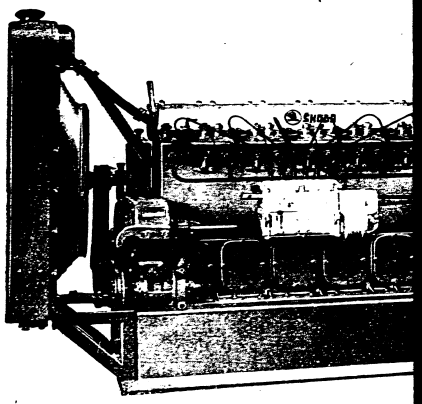
tarting is shown on the front

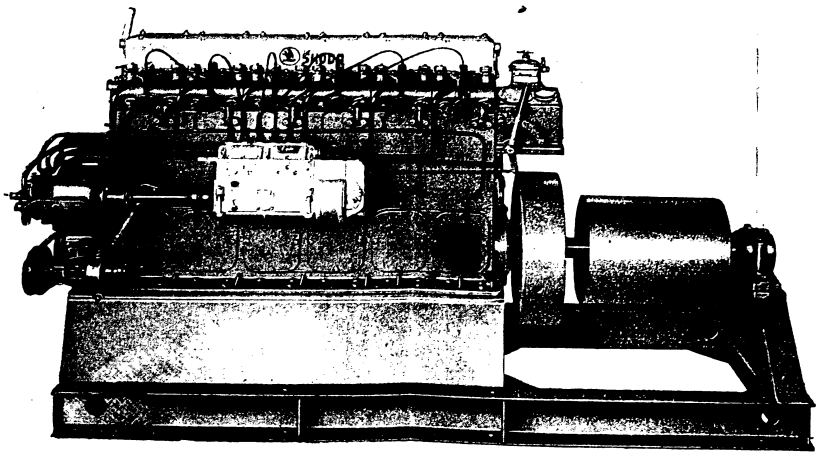
↓ ŠKODA 4S110 Diesel Engine with electric starting, standard design



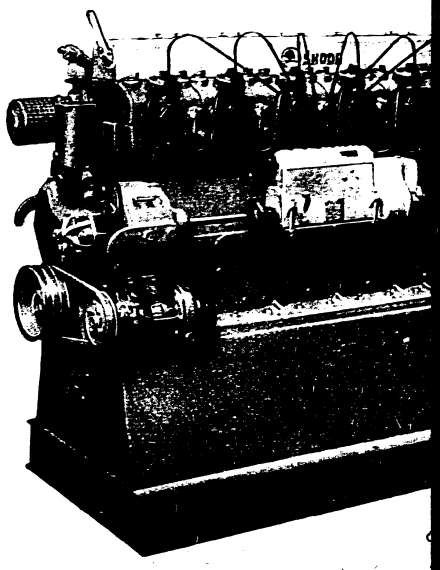

↓ ŠKODA 6S110 Diesel Engine with electric startin
shaft and outside bearing



↓ ŠKODA Diesel Engine generating set, 40 kV
ŠKODA 6S1




↑ ŠKODA 6S110 Diesel Engine with compressed air starting, special design with extended shaft, belt pulley and outside bearing on common bed plate



The photographs and dimension drawings are only
alterations and improvements as nec

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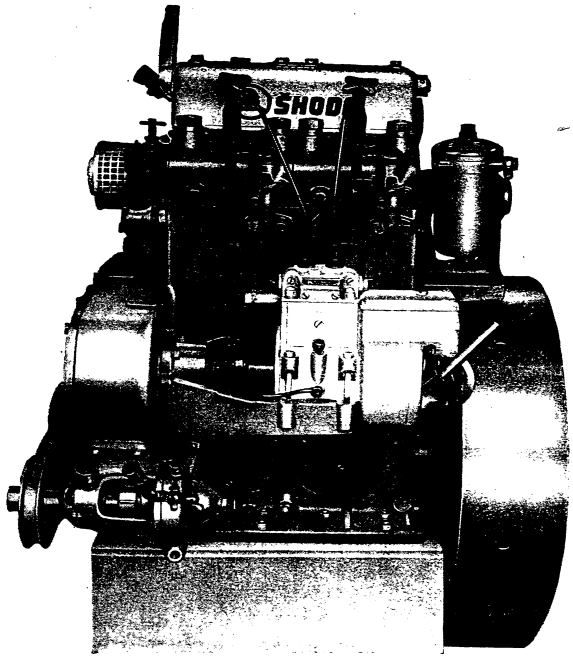
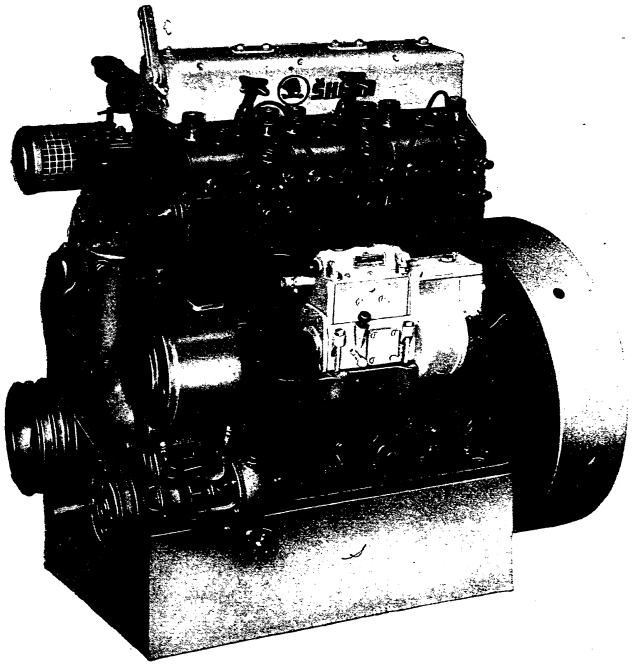
↓ ŠKODA 2S110 Diesel Engine with hand starting, standard design

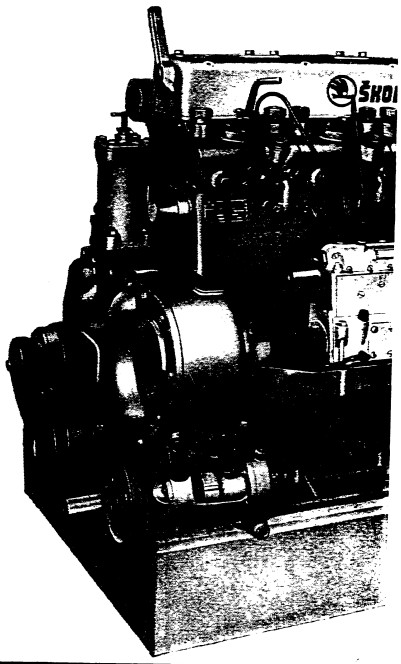


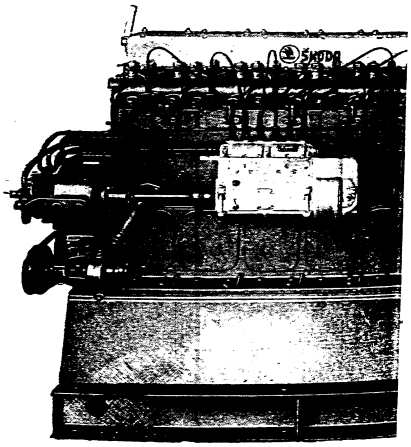
↓ ŠKODA 3S110 Diesel Engine, standard design



A ŠKODA 6S110 Diesel Engine of standard design with compressed air starting is shown on the front page.

↓ ŠKODA 4S110 Diesel Engine with





↑ ŠKODA 6S110 Diesel Engine with compressed belt pulley and outside bear

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[redacted]

The engine is pressure lubricated by means of a gear type oil pump drawing oil from the sump in the lower part of the engine casing through a coarse oil cleaner and delivering it through a lamination type filter to the various lubricating points. The oil pressure is indicated by a pressure gauge and can be adjusted by a reducing valve. The oil cleaner may be cleaned even while the engine is running. To special order and at an extra charge the engines may be equipped with an oil cooler. The oil cooler is, however, only recommended for hot climates.

[redacted]

The standard type of engine is equipped with through flow cooling by means of a centrifugal water pump which draws water from a cooling tower or other source and delivers it to the water jacket of the cylinders and then to the cylinder heads from which it flows to the discharge. To special order and at an extra charge the engines may be supplied equipped with a circulating cooling system with a motor-car type radiator and fan.

[redacted]

The engines may be supplied equipped with any starting system listed in the accompanying tables.

| Starting by | hand | compr. air | Electricity |
|---|---|---|---|
| Type of ŠKODA engine | 2S110r | 2S110v | — |
| | 3S110r | 3S110v | 3S110e |
| | | 4S110v | 4S110e |
| | | 6S110v | 6S110e |

Compressed air starting is done by means of compressed air from an air bottle through a starting cock, distributor and starting valves on the cylinder heads. The bottle is charged by means of a charging valve on the last cylinder which works, during the charging period, as a compressor with the fuel shut off at the corresponding injection valve.

Electric starting is effected by means of an electric starter motor engaging with the gearing of the flywheel and supplied with electric power from a battery. The battery is charged automatically by a charging dynamo fitted to the engine. Please specify in your order the required method of starting.

[redacted]

[redacted]

Vertical four-stroke ŠKODA-S110 Diesel engine with indirect, solid injection, with natural suction and pressure lubrication.

[redacted]

BSS 649/1949

[redacted]

The outputs given in the table on page 1 are rated outputs at rated speeds and a 12 hour operation. The engine may be overloaded by 10 per cent for a period of 1 hour and by 20 per cent for a period of 1 minute. The rated outputs listed apply to an atmospheric pressure of 749 mmHG (29.5 inches of mercury), an engine room temperature of 29.4° C (85° F) and a humidity equal to a vapour pressure of 15 mmHG (0.6″). The continuous output (for a period exceeding 24hours) is approximately 90 per cent of the rated output. If the engine is required to operate under conditions different from those described above the outputs will change as follows:

a) for each temperature increase of 2.8° C (5° F) the engine output decreases by 1 per cent,
b) at humidities above 15 mm (0.6″) mercury the output drops by 1 per cent for a vapour pressure increase of 6.35 mm (0.25″) mercury.



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The design of Škoda-S110 Diesel engines is very advanced as a result of many years of tradition in the manufacture and operation of Diesel engines. Thanks to the most suitable materials, perfect workmanship and the most modern manufacturing methods introduced in the world famous Škoda factories, these engines have a reputation for complete reliability and long life proved by their service to customers all over the world and under the most difficult conditions.

[redacted]

The engine casing is divided into two parts. The upper cast iron part of the casing carries the main bearings and the exchangeable wet cylinder liners are fitted in it. The lower cast iron part of the casing forms the lubricating oil sump which is provided with ribs to afford perfect cooling of the lubricating oil.

[redacted]

The crankshaft is forged of high grade steel in the famous ŠKODA or POLDI steel works. The main bearings have steel bushes lined with white bearing metal.

[redacted]

The forged connecting rods have an "H" section. The split big end bearing has its upper half lined with lead bronze and lower half lined with white bearing metal. The small end bearing bush is undivided and made of phosphor bronze.

[redacted]

The pistons are made of aluminium alloy and provided with 4 compression and 2 scraper rings. The hollow floating gudgeon pins are made of high grade steel and cemented, hardened and ground.

[redacted]

The cylinder heads accomodate mutually interchangeable suction and exhaust valves. The valves are operated from the camshaft cams by tappets, push rods and rocker arms. The camshaft is driven off the main shaft by means of helical gears. The combustion chamber of the cylinder head is provided with a turbulence chamber into which fuel is injected through a pin-type nozzle. The perfect shape of the turbulence chamber ensures a thorough mixing of the fuel with the compressed air, and, as a result, a perfect combustion of fuel and a low fuel consumption.

[redacted]

The fuel injection pump is of the block design and has a separate injection element for each cylinder. The piston of each injection element is provided with a spiral groove which is rotated by the governor to control the end of the fuel injection. The beginning of the fuel injection is set pérmanently on the test floor of the works.

[redacted]

The governor is of the centrifugal type and is fitted to the fuel injection pump. The required springs are fitted into it on our test floor in accordance with the customer's order to suit the drive for which the engine is intended, i. e.

either 1. springs for a constant engine speed, i. e. for 1000, 1200 or 1500 r. p. m.

or 2. springs for a variable engine speed for a range of 400 to 1500 or 400 to 1000 r. p. m.

In the first case the springs keep the speed constant and the engine is therefore suitable for driving generators, pumps and similar constant speed machines. The speed of engines equipped in this manner can only be changed by replacing the governor springs.

In the second case the springs are designed for continuous regulation and permit a reduction of speed from the rated r. p. m. to 400 by means of a speed control lever, even while the engine is running, and the engine is therefore suitable for driving variable speed machines such as excavators, road rollers, winches, etc.

Please always quote in your order the kind of speed control required or the type of springs and rated speed.

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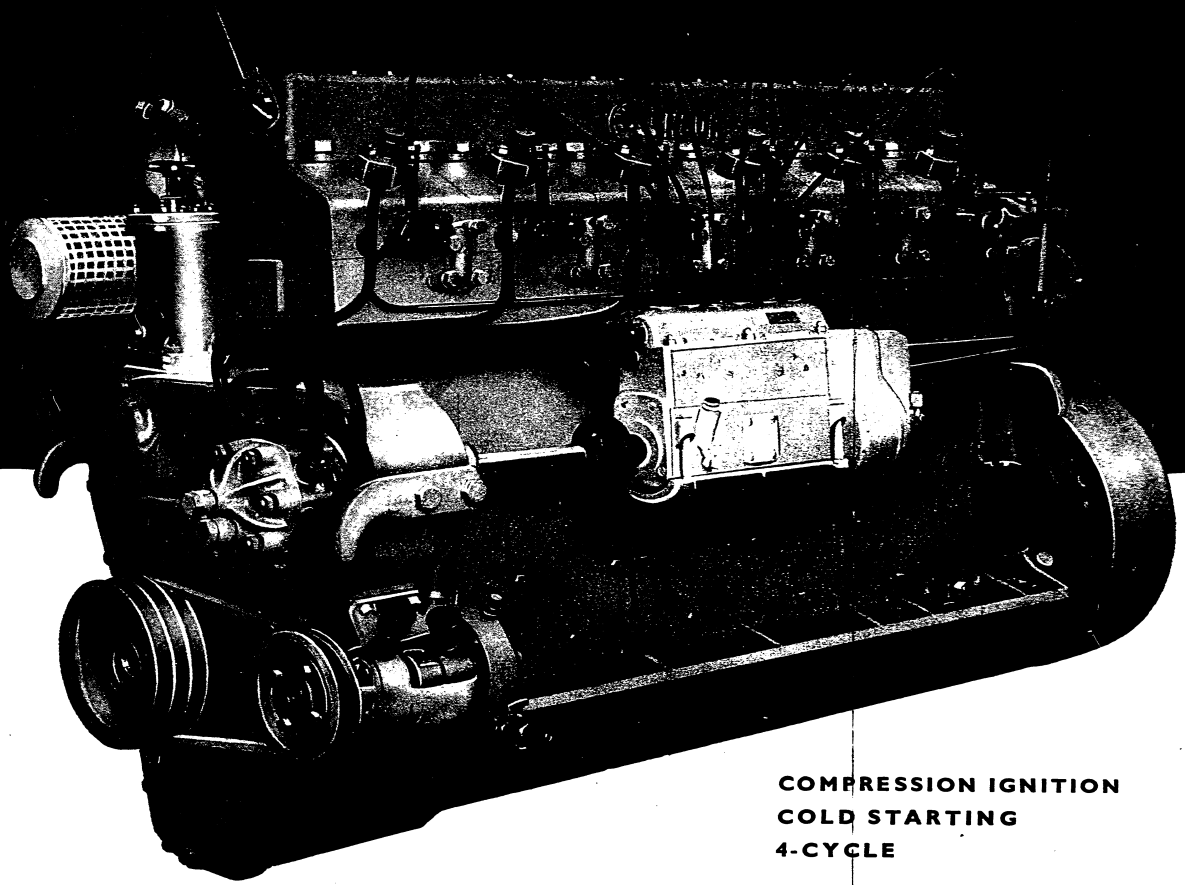

**COMPRESSION IGNITION**
**COLD STARTING**
**4-CYCLE**

| Type | Number of cylinders | Rated output at 1000 r.p.m. HP | Rated output at 1500 r.p.m. HP | Starting | Engine weight pounds net | Engine weight pounds gross | Engine weight kilos net | Engine weight kilos gross | Shipping space cu y | Shipping space cu m |
|---|---|---|---|---|---|---|---|---|---|---|
| ŠKODA 2S110 | 2 | 20 | 30 | hand | 1280 | 1620 | 580 | 735 | 1.7 | 1.3 |
| | | | | compr.air | 1465 | 1810 | 665 | 820 | | |
| ŠKODA 3S110 | 3 | 30 | 45 | hand | 1520 | 1930 | 690 | 875 | 2.1 | 1.6 |
| | | | | compr.air | 1700 | 2105 | 770 | 955 | | |
| | | | | electric | 1785 | 2195 | 810 | 995 | | |
| ŠKODA 4S110 | 4 | 40 | 60 | compr.air | 1940 | 2425 | 880 | 1100 | 3.15 | 2.4 |
| | | | | electric | 2020 | 2505 | 915 | 1135 | | |
| ŠKODA 6S110 | 6 | 60 | 90 | compr.air | 2500 | 3120 | 1135 | 1415 | 3.6 | 2.75 |
| | | | | electric | 2560 | 3180 | 1160 | 1440 | | |

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## WEIGHT AND DIMENSIONS OF THE HEAVIEST PART TO BE LIFTED DURING ERECTION:

[redacted]

Weight of the heaviest part to be lifted during maintenance: 330 kilos (725 lbs) (cylinder head).
Dimensions in mms. are accurate, dimensions in inches approximate only.

[redacted]

[redacted]

With barring lever and coupling bolts.

[redacted]

Double piston water pump fixed to the frontside of the engine.

[redacted]

One charging compressor fixed to the frontside of the engine and driven from the crankshaft together with the pumps.

[redacted]

for starting, with fittings and piping. (Capacity for 6 to 8 cylinder engines 400 litres [88 galls ].)

[redacted]

Tubular, water circulation oil cooler for normal temperature conditions (mounted on the engine). Hand operated pump for priming the lubricating system before starting (fixed to the engine). One oil pressure gauge (mounted on the engine).

[redacted]

Dry suction air cleaner acting simultaneously as suction silencer, fitted to the suction piping of the engine.

[redacted]

Exhaust manifold on the engine.
Exhaust silencer.
1 Exhaust thermometer for each cylinder.

[redacted]

for fixing the engine to the foundations.

[redacted]

on a board and special tools.

[redacted]

fitted to the engine.

[redacted]

Each cylinder head carries one thermometer indicating the outlet water temperature.

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[redacted]

The engine can be supplied in left or right hand design. The starboard engine has the flywheel on the right hand side when looking at the valve gear, and the portboard on the left. On both port and starboard engines the rotation can be clockwise or anti-clockwise. Therefore when ordering state:

a) Whether a port or starboard engine is to be supplied (with single screw vessels the engine design is of no importance).

b) The direction of rotation of the engine when looking at the flywheel end.

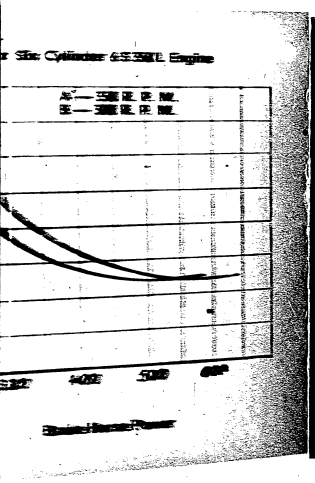
[redacted]

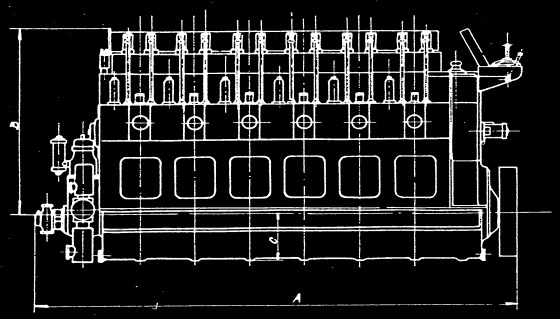
| | |
|---|---|
| Cylinder bore | 350 mm (13¾") |
| Piston stroke | 500 mm (19⅝") |
| Compression pressure | 33 kg sq. cm (469 lbs sq. inch) |
| Combustion pressure | 50 kg sq. cm (712 lbs sq. inch) |
| Exhaust temperature at full load | 425° C (797° F) |
| Internal diameter of exhaust pipe | 191 mm (7½") |

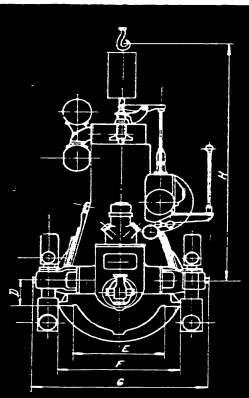
[redacted]

Standard flywheels are supplied in the following diameters and weights:

| For | 6 | 8 | cylinders |
|---|---|---|---|
| dia. mm | 1330 | 1350 | |
| inches | 4'5⅛" | 4'5⅛" | |
| Weight | | | |
| kg | 1650 | 1650 | |
| lbs. | 3630 | 3630 | |







## APPROXIMATE DIMENSIONS

| Type | | A | B | C | D | E | F | G | H |
|---|---|---|---|---|---|---|---|---|---|
| 6 S 350 L | mm | 5420 | 2220 | 590 | 305 | 1000 | 1300 | 1934 | 2500 |
| | inches | 17'9¹/₄" | 7'3³/₈" | 1'11¹/₄" | 1' | 3'3³/₈" | 4'3¹/₈" | 6'4¹/₈" | 8'2⁴/₈" |
| 8 S 350 L | mm | 6620 | 2220 | 590 | 305 | 1000 | 1300 | 1934 | 2500 |
| | inches | 21'8¹/₈" | 7'3³/₈" | 1'11¹/₄" | 1' | 3'3³/₈" | 4'3¹/₈" | 6'4¹/₈" | 8'2⁴/₈" |

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[redacted]

[redacted]

Vertical enclosed four stroke Škoda marine Diesel engine with direct airless injection, naturally aspirated, with pressure lubrication.

[redacted]

British Lloyd, Bureau Veritas, the Register of the U.S.S.R.

[redacted]

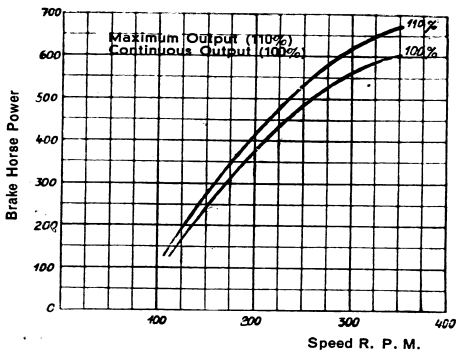
The rated output values shown in the table on Page 1 are stated for continuous operation at 350 R. P. M. It is possible to overload the engine by 10% for a period of 1 hour and by 20% for a short period. These rated values are understood under the following conditions: atmospheric pressure of 749 mm Hg, i. e. 29.5 inches of mercury, an engine room temperature of 29,4° C, i. e. 85° F and a humidity equal to a mercury vapour pressure of 15 mm, i. e. 0,6". If the engine works under conditions differing from those specified above the output changes as follows:

a) For each decrease or increase of barometric pressure by 6,35 mm, i. e. ¼ inch mercury, the engine output decreases or increases by 1%.

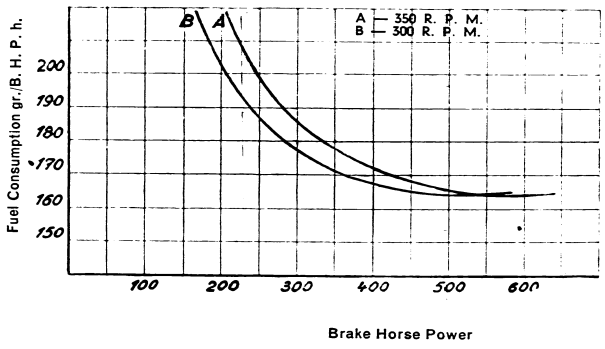
b) For each temperature increase by 2,8° C, i. e. 5° F, the engine output decreases by 1%.

c) At humidities above 7 mm, i. e. 9/32" mercury the output drops by 1% for a vapour pressure increase by 6,35 mm, i. e. ¼ inch mercury.

Maximum, Rated and Continuous Performance Curves of Six Cylinder 6 S 350 L Engine




Fuel Consumption Curves for Six Cylinder 6 S 350 L Engine




[redacted]

| at | 100% | 75% | 50% of the rated output |
|---|---|---|---|
| gr/B. H. P. h. | 165 | 170 | 188 |
| lbs/B. H. P. h. | 363 | 374 | 414 |

subject to a tolerance of 5% when using fuel of a suitable grade having a gross calorific value of 10.750 Kcal/kg (19.350 B. T. U. 's. per lb).

[redacted]

At rated engine output the make up oil consumption is 2,2 gr/H. P. h. (.0048 lbs/H. P. hour) subject to a tolerance of 10%. Škoda Diesel engines can operate on appropriate good quality fuel and lubricating oil commonly used for oil engines. Each engine is tested in our works at rated load and overload and the fuel and lubricating oil consumption values obtained are recorded and certified.

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The design of the Škoda Diesel engines is very advanced and in all respects in line with the requirements and purposes for which they are intended. This is the result of a 30 years' tradition in marine oil engine building.

The engine is efficient and reliable and has proved successful in heavy duty operation due to the careful choice of thoroughly tested materials and to precision machining by means of modern production methods. The same applies to spare parts, also made of high quality material and machined to the same limits. Special attention has been devoted to making all parts of the engine easily accessible for cleaning and inspection.

The engine conforms with the regulations of the British Lloyd (Bureau Veritas or the Register of the U.S.S.R.) and can be built under the survey of any of these authorities at an extra charge.

Engines are supplied with direct reversing equipment either for direct propeller drive or through a suitable reduction gear.

The normal speed of this type is 350 R. P. M.; for special purposes we offer engines of a lower speed with correspondingly lower outputs.

[redacted]

The lower part of the cast iron casing is of sturdy design and houses the main bearing. The upper cast iron part accommodates the cylinder liners and is provided with large side doors giving access to the crank mechanism. The wet liners are fixed at the top by the cylinder head and are free to extend downwards. They can be easily replaced.

[redacted]

forged in the world-famous Škoda Forges from material of high tensile strength and toughness, is made of one single forging. The main bearings are of steel, white metal lined and pressure lubricated.

[redacted]

have an "O" or "H" section. The split big end bearing is lined with white metal and bolted to the connecting rod. By inserting shims the distance between the two bearings can be adjusted. The small end is unsplit and has a steel bush with lead-bronze lining.

[redacted]

are made either of a special cast iron or of aluminium alloy and are fitted with 5 pressure and 2 scraper rings. The gudgeon pins are of the floating type made of high grade case hardened and ground steel.

[redacted]

The cylinder heads accommodate the interchangeable suction and exhaust valves. The valves are operated from the camshaft by pushrods and rocker arms. The camshaft is driven from the main shaft by means of bevelled toothed spur gears. One injection valve of the closed type with multiple-hole nozzle is accommodated into the centre of each cylinder head, ensuring perfect atomizing and combustion of the fuel and, as a result, low fuel consumption. Each cylinder head has a safety valve.

[redacted]

A separate injection pump individually adjustable is provided for each cylinder. The fuel is cleaned by means of a laminated filter accommodated in the fuel supply piping, and by means of a dual filter with felt filtering elements on the engine in front of the injection pump.

[redacted]

The engine is under governor control at all speeds which are maintained within very fine limits whatever the change in load.

[redacted]

A forced lubricating system ensures perfect lubrication of all moving parts. The geared oil pump with adjustable by-pass valve draws lubricating oil from the tank and delivers it over a laminated filter and oil cooler to all lubricated points from which the oil flows back to the sump and thence back into the oil tank.

[redacted]

Cooling water is supplied by two single acting reciprocating pumps with plunger, gland and valves of bronze. The output of either of the pumps is sufficient for supplying the required amount of cooling water to the engine. One of the pumps can be employed as a bilge pump. The temperature of the outlet water must not exceed 60° C (140° F). If the hardness of the water exceeds 5 mg $CaCO_3$ in 100 $cm^3$ (3,5 grains per gallon), if it is considerably polluted or if the engine is cooled with sea water, indirect cooling must be applied. The necessary equipment can be supplied at extra charge.

[redacted]

The engine is started by compressed air supplied from an air bottle to the starting slide valves. Each cylinder is equipped with a slide valve which is controlled by a cam of the camshaft. When the slide valves have been opened compressed air is admitted to the cylinders in the correct order. In non-reversing engines the supply of air to the valve gear is controlled by a hand wheel operated valve. In direct reversing engines starting, stopping and reversing is effected pneumatically by a hand lever controlled device. The speed is controlled by another lever enabling fine graduation.

The engine can be started instantly when cold and loaded within a few seconds.

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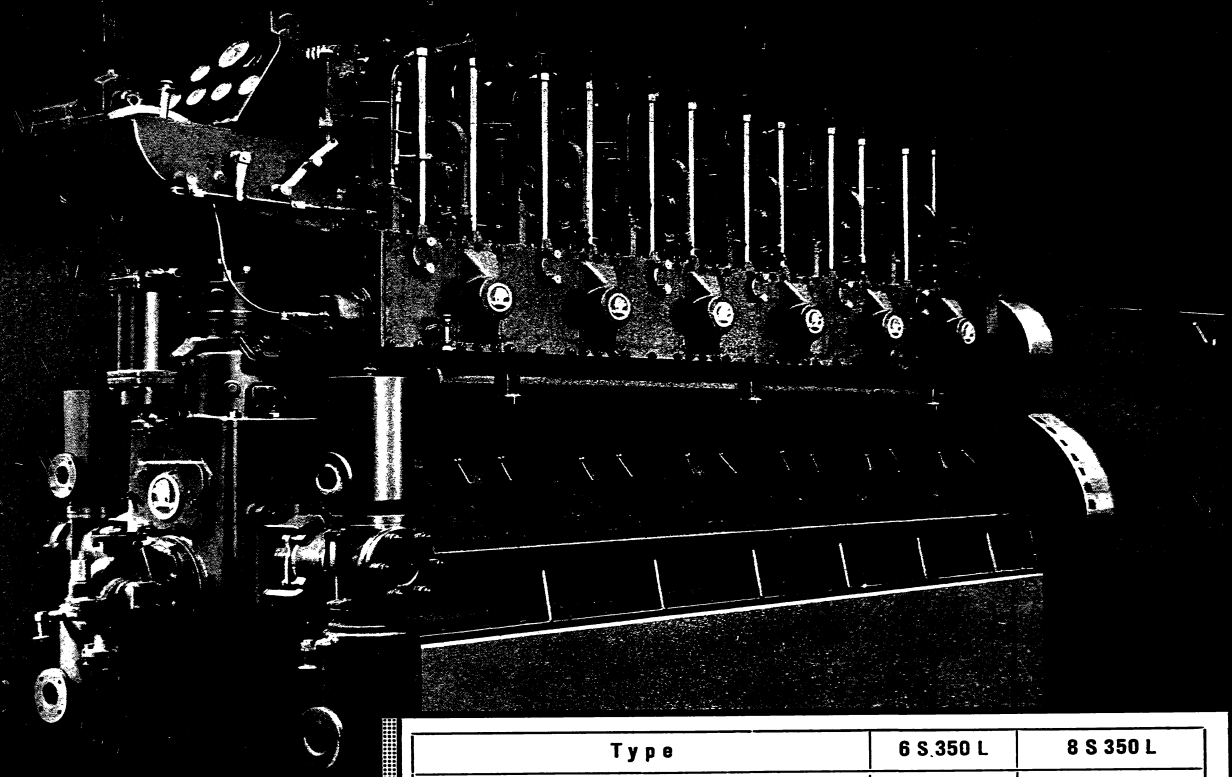
# MARINE DIESEL-ENGINES

| Type S 350 L | |
|---|---|
| Number of Cylinders | 8—6 |
| Output | 585—800 H. P. |
| Bore | 350 mm (13³/₄″) |
| Stroke | 500 mm (19³/₄″) |
| Speed | 350 R. P. M. |



| Type | | 6 S 350 L | 8 S 350 L |
|---|---|---|---|
| Direct Reversing Engine B. H. P. | | 600 | 800 |
| Direct Reversing Engine for drive over a reduction gear B. H. P. | | 585 | 780 |
| Number of cylinders | | 6 | 8 |
| Net weight (including standard accessories without reduction gear) | kilos<br>lbs | 34100<br>53000 | 30800<br>67700 |
| Gross weight (seaworthy packing) | kilos<br>lbs | 28800<br>63400 | 36500<br>80400 |
| Shipping space | cu. metres<br>cu. ft. | 47,3<br>1670 | 60<br>2120 |

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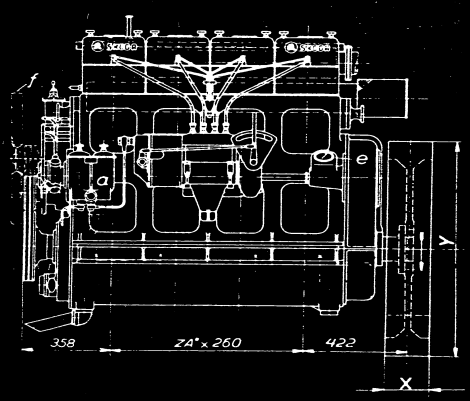
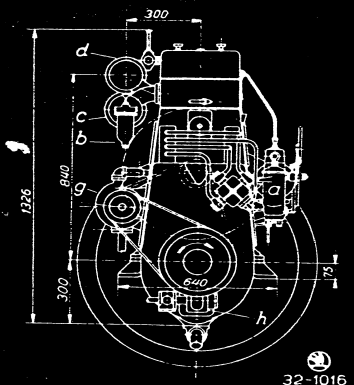
The following special equipment is available against extra charge:

Common bed plate for engine and generator.
Welded bed plate for engine and motor type radiator.
Welded bed plate for engine with extended shaft and outside bearing.
Standard belt pulley.
Hand compressor for charging of compressed air bottles with 3 metres (10') of pipe.
Motor car type radiator with fan and fan drive.
Oil cooler.
Exhaust silencer.
Semi-rotary pump for filling of fuel tank.

NOTE:

Customers are requested to obtain from us the foundation drawing before the beginning of the erection.
We reserve ourselves the right to carry out alterations in design and improvements. The illustrations, weights and dimensions are therefore not binding.

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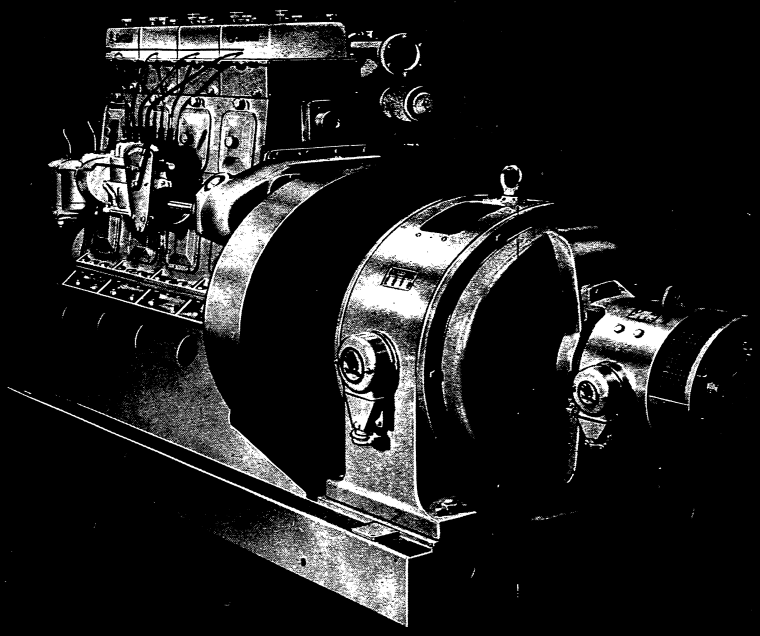

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governors which maintain a constant speed within 5% limits. The set speed can be altered by changing the governor springs and altering the fuel injection advance. Type L 160 marine engines are equipped with governors which permit the speed to be varied during operation within a wide range, i. e. from 750 to 200 r. p. m.

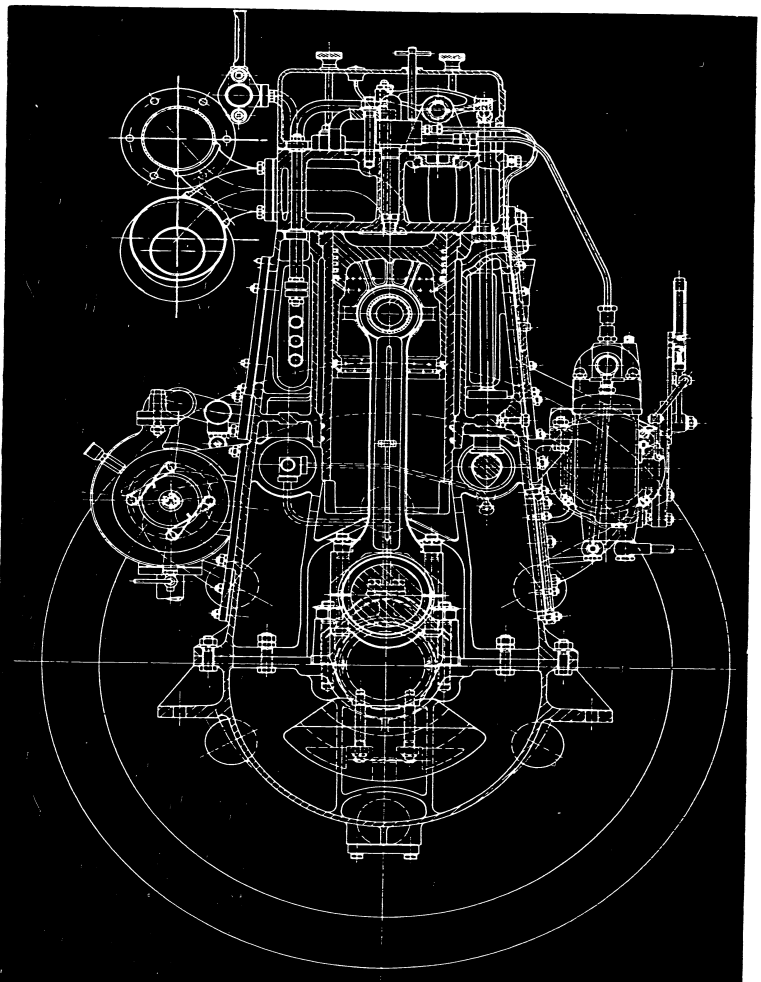
| Guaranteed fuel consumption | grams per HP hour | lbs. per HP hour |
|---|---|---|
| At 100% load | 180 | 0.397 |
| At 75% load | 190 | 0.419 |
| At 50% load | 210 | 0.462 |

FUEL CONSUMPTION:

The fuel consumption figures stated above are subject to a permissible deviation of 5% and apply for an air temperature of 29.4° C (85° F), a barometric pressure of 749 mm (29 1/2") of mercury column and fuel with a minimum calorific value of 10 750 kcal per kg (19 350 B. T. U. per lb.).

LUBRICATION. The circulating pressure oil lubricating system ensures the supply of ample quantities of lubricating oil to all moving parts of the engine. A gear type oil pump driven by the crankshaft through a gear draws the oil from the sump in the crankcase through an oil cleaner and delivers it to the main oil pipe and through it to the main bearings, the camshaft bearings and the valve push rods. The used oil returns to the sump in the crankcase. A control valve affords an adjustment and an oil pressure gauge a check of the oil pressure. The lubricating oil consumption is 3 to 4 grams (0.0066 to 0.0088 lbs.) per HP hour at 100% load.

COOLING. The engine can either be cooled by running fresh water or by circulating water. A centrifugal cooling water pump is included in the supply of the engine. A motor car type radiator and fan may also be supplied to special order if required. The cooling water consumption is about 15 litres (3.3 Imp. Gallons) per HP hour with the cooling water temperature assumed to be 15° C (59° F).



COMPRESSED AIR STARTING. The air supplied from the compressed air bottle to the distributor is admitted to the individual cylinder in accordance with the firing order of the engine. The compressed air bottles can be charged directly by the engine. For that purpose the head of the first cylinder is fitted with a charging valve. A two-stage hand compressor serving as a stand-by for hand charging of compressed air bottles may be supplied against extra charge.

THE SUPPLY OF THE ENGINE INCLUDES (unless specified otherwise in the tender): 1 standard flywheel, 1 fuel tank for 8 hours' operation with oil cleaner, stop valve and 3 metres (10') of fuel feed pipe, 1 thermometer for cooling water, 1 oil pressure gauge, 1 compressed air bottle (capacity approx. 75 litres or 16.5 Imp. Gallons for 4-cylinder engines, 100 litres or 22 Imp. Gallons for 6 and 8 cylinder engines), 3 metres (10') each of compressed air starting and bottle charging pipe, 1 set of spanners and tools and the following spare parts: 1 set of important springs, 1 set of gaskets and piston rings.

The supply of marine engines does not include the fuel tank.

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# ŠKODA DIESEL ENGINES

Bore 160 mm (6 19/64")
Stroke 225 mm (8 55/64")

| TYPE ŠKODA | | STATIONARY ENGINES | | | MARINE ENGINES | |
|---|---|---|---|---|---|---|
| | | 4 S 160 | 6 S 160 | 8 S 160 | 4 L 160 | 6 L 160 |
| Number of cylinders | | 4 | 6 | 8 | 4 | 6 |
| Output in HP at 750 r. p. m. (22.5 HP per cylinder) | | 90 | 135 | 180 | 90 | 135 |
| Weight of engine with standard equipment | kg/lbs net | 2250/4950 | 2900/6400 | 3400/7500 | 2050/4500 | 2820/6300 |
| | kg/lbs gross | 2900/6400 | 3700/8150 | 4300/9500 | 2600/5750 | 3600/8000 |
| Volume of seaworthy packing case in cubic metres/cubic feet | | 5.8/205 | 6.6/335 | 7.9/280 | 5.8/205 | 6.6/335 |

ŠKODA vertical, four-stroke, solid injection Diesel engines. The crankshaft assembly, camshaft as well as camshaft and valve drive are completely enclosed, yet easily accessible. The engine consists of the crankcase, cylinder block and cylinder heads. The sturdy crankcase is made of high grade cast iron. The lower part of the crankcase contains the main bearings the shells of which are lined with high grade white metall. The shims between the split bearing shells afford an adjustment of the necessary play between the shells and the crankshaft journals. The bearing at the flywheel end is designed as a guide bearing and carries the thrust of the helical gears driving the camshaft.

The CYLINDER BLOCK is made in one piece and screwed to the crankcase. The easily exchangeable water cooled cast iron cylinder liners are fitted inside the cylinder block. A double rubber seal on the lower part of the liner separates the water space from the crankcase.

The CYLINDER HEADS, which cover the top of each cylinder separately, are made of close grain cast iron and are hydraulically tested. Each cylinder head carries 1 inlet valve, 1 exhaust valve, 1 multiple-hole nozzle with pin arranged in the center and 1 starting valve. The shape of the combustion chamber ensures perfect combustion of the fuel at any output and speed of the engine within normal limits.

The wear resisting PISTONS made of light weight alloy are provided with 4 compression and 2 scraper rings, the former being fitted above, the latter below the gudgeon, pin. The hollow floating gudgeon pin is hardened, accurately ground and held in position by two circlips.

The drop-forged CONNECTING RODS are provided with drilled channels for the oil lubricating of the gudgeon pins. The big end bearing of generous dimensions is provided with shims for the adjustment of the bearing play. The top half of the steel bearing shell is lined with a thin layer of lead bronze, the bottom half with white bearing metal.

The CRANKSHAFT which is of ample size, is forged of high grade carbon steel and accurately machined. The crankshafts of 4-cylinder engines are provided with balancing weights to reduce the bearing pressure and damp vibrations during idling. The lubricating oil flows under pressure through channels drilled in the crankshaft from the main journals of the connecting rod to the crankpins. A flywheel keeps the cyclic irregularity of the engine down to the specified figure.

The INLET AND EXHAUST VALVES are pressed of heat and corrosion resisting steel and are provided with cast iron guides. The valves are operated by push rods actuated by the camshaft. The clearance between the valve and rocker arm can be adjusted by means of an adjusting screw. The cams and journals of the camshaft are hardened and accurately ground. All moving parts of the engine are lubricated with pressure oil.

The FUEL INJECTION EQUIPMENT consists of a multi-cylinder fuel injection pump, a separate element of the pump being used for each cylinder and delivering an accurately measured quantity of fuel to the fuel injection nozzle. The quantity of fuel supplied can be varied by rotating the piston of the fuel injection pump by means of a control rack. The piston is provided with a helical groove which fixes the beginning and end of the pressure stroke at various positions of the piston. The fuel injection nozzles open under the pressure of the fuel injected through them into the combustion chamber. All moving parts of the fuel injection equipment are easy to exchange.

A CENTRIFUGAL GOVERNOR, which is driven by the camshaft of the fuel injection pump and attached to the flange of the pump, controls the speed of the engine. The tension of the governor springs can be varied by hand by means of a hand lever during operation. This varies the speed of the engine. Type S 160 stationary engines are equipped with

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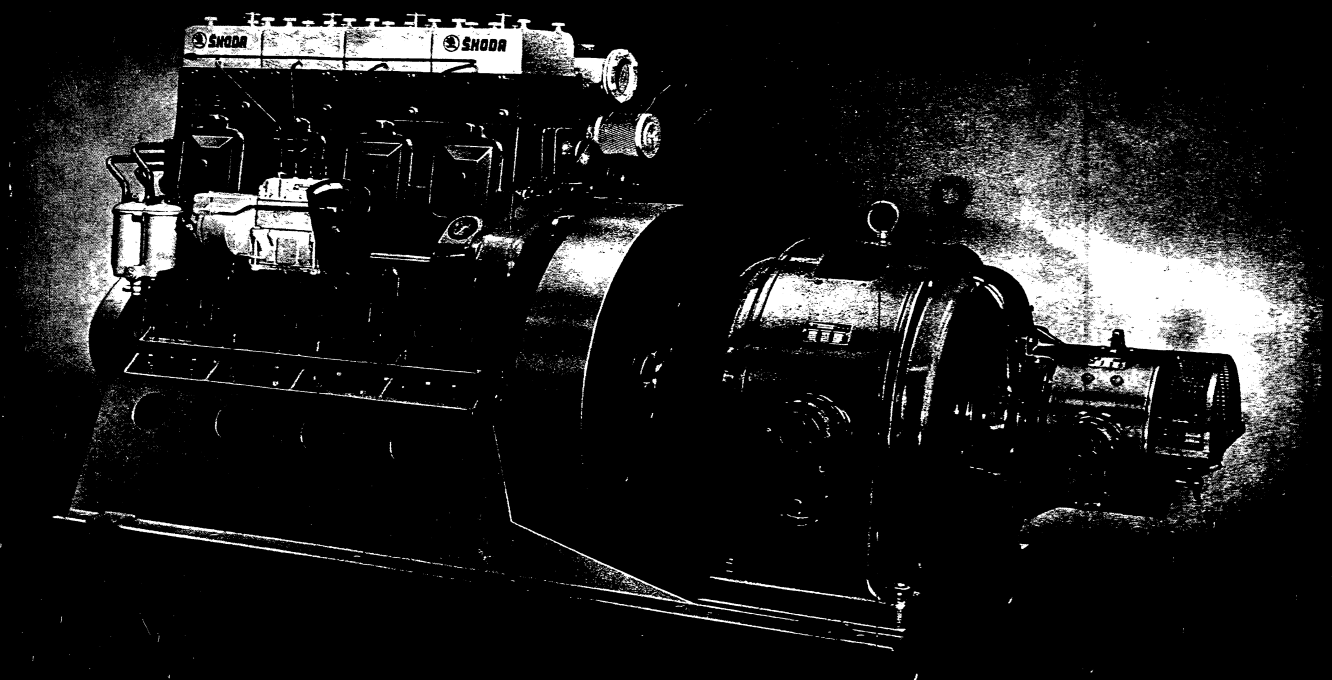
# ŠKODA

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# NGINES, TYPES D 5 - D 8 - D 12 - D 15

application they are supplied either in stationary design or portably mounted on a four wheel undercarriage. The fuel of a low injection and combustion, easy starting of cold engine and low fuel consumption. Almost all elements are are particularly suited for the drive of various industrial and agricultural machines, irrigation equipment, pumps, etc.

rings.
dated

The suction and exhaust valves are made of special steel, resisting high temperature. They are operated from the camshaft by tappets, push rods and rocker arms. The camshaft, timing gears and tappets are lubricated by sprayed oil, the rocker arms are provided with greasecups.

**Valves**

and

The fuel is injected into the cylinder by a pump with the help of a pin nozzle the operation of which is accurately governed.

**Fuel Injection Pump**

ented

The governor of reliable design adjusts the quantity of fuel injected, thus maintaining constant speed of the engine.

**Governor**

end

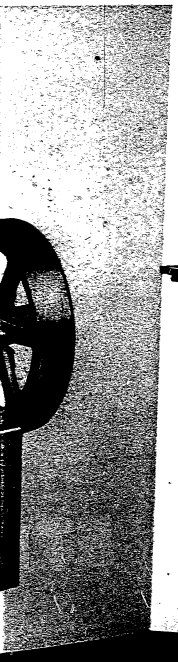
The engines may be supplied either with through-flow cooling, or a circulating cooling system or with a water tank and screen. A centrifugal cooling water pump driven by a belt is mounted directly on the engine block. The consumption of cooling water is 16 litres per HP per hour, provided its intake temperature is 15 °C. The cooling system with water tank and screen is supplied only for portable engines and on special request.

**Cooling**

(see

Spray oil lubrication is simple and reliable. Oil consumption at full load of the engine: 6—6,5 g per HP an hour.

**Spray Oil Lubrication**



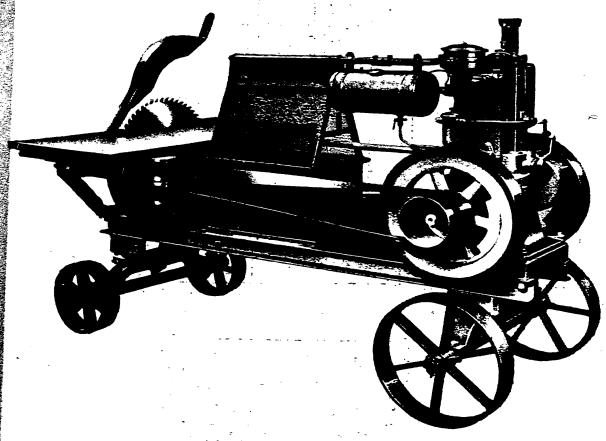


**Table of Weights for Standard Types and Standard Accessories**

| TYPE | | D 5 | D 8 | D 12 | D 15 |
|---|---|---|---|---|---|
| Net weight of engine | kg | 265 | 355 | 505 | 703 |
| Seaworthy packing | kg | 85 | 95 | 115 | 117 |
| Cubic volume of seaworthy packing | cu. m | 0,8 | 0,9 | 1,3 | 1,6 |

Flywheel and belt pulley

| | | | | | |
|---|---|---|---|---|---|
| Diameter and width of flywheel | mm | 500/75 | 550/90 | 680/120 | 800/120 |
| Diameter and width of belt pulley | mm | 180/135 | 220/152 | 380/200 | 400/205 |
| Cyclic irregularities | | 1:27 | 1:25 | 1:24 | 1:22 |

**Normally the engine is fitted with two flywheels and one belt pulley.**

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# SLAVIA LOW-SPEED ENGINES, T

These engines are of vertical four-stroke design. In view of their wide field of application they are supplied either
is injected into a turbulence chamber. This arrangement offers the advantage of a low injection and combustion,
completely protected against penetration of dust impurities. These engines are particularly suited for the driv

**Engine Casing** is cast as a single unit. It is provided with an inspection lid and carries the exchangeable crankshaft bearings. These bearings are ring lubricated and lined with white metal. The timing gears are also accommodated in the engine casing. The lower part of the engine casing forms the lubricating oil sump

**Cylinder Liner** made of special alloy is exchangeable. The removable cylinder head carries the suction, exhaust and injection valves and the ignition cartridge holder.

**Piston** — cast of aluminium alloy is fitted with 3 compression and 1 scraper ring. The gudgeon pin is cemented and held in the piston by two securing rings.

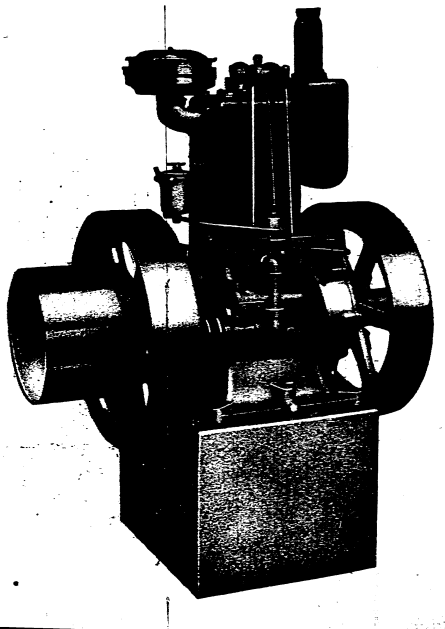
**Connecting Rod** The big end bearing is lined with white metal. The small end bearing has a bronze bush. The big end bearing is lubricated by oil scooped by a lubricating elbow fitted to the end of the connecting rod.

**Crankshaft** is forged of high-grade steel, the pins are ground. The crankshaft runs in ring lubricated bearing (see engine casing).

**Technical data**

| TYPE | | D 5 | D 8 | D 12 | D 15 |
|---|---|---|---|---|---|
| Number of cylinders | | 1 | 1 | 1 | 1 |
| Rated output | HP | 5 | 8 | 12 | 15 |
| Bore | mm | 100 | 120 | 145 | 155 |
| Stroke | mm | 125 | 150 | 170 | 180 |
| Rated speed | r. p. m. | 900 | 800 | 700 | 650 |
| Cylinder capacity | cu. cm | 980 | 1710 | 2807 | 3400 |
| Fuel consumption of a minimum calorific value of 10 750 kcal per kg* | g/HP/h | 210 | 210 | 210 | 212 |

*) Subject to tolerance of ± 5 %.



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# Slavia DIESEL

SLAVIA

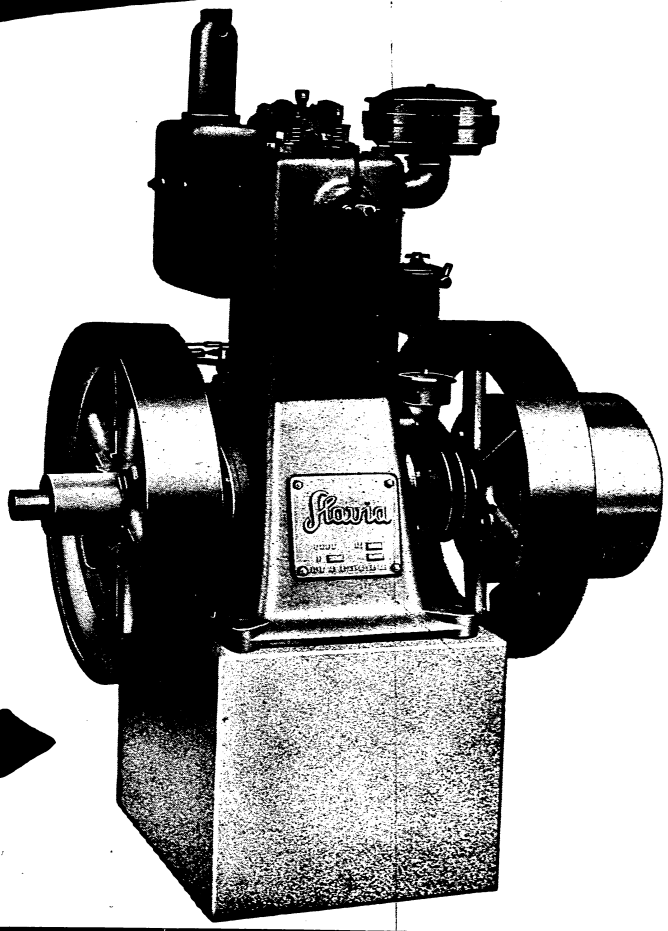
low-speed engines

output 5, 8, 12 and 15 HP

simple and

robust design — easy servicing

low fuel consumption




Slavia

**STROJEXPORT** PRAHA - CZECHOSLOVAKIA

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**WEIGHT AND DIMENSIONS OF THE HEAVIEST PART TO BE LIFTED DURING ERECTION:**

[redacted]

Weight of the heaviest part to be lifted during maintenance: 156 kilos 343 lbs (cylinder head)
Dimensions in mms. are precise, dimensions in inches approximate only.

[redacted]

With barring lever and coupling bolts.

[redacted]

Fuel tank without support, sufficient for 8 hours operation. Hand operated pump for supply of fuel to the above tank.

[redacted]

Tubular water circulation oil cooler for normal temperature conditions (mounted on the engine)
Hand operated pump for priming the lubricating system before starting (fixed to the engine).
Oil tank.
One oil pressure gauge (mounted on the engine).

[redacted]

Dry suction air cleaner acting simultaneously as suction silencer, fitted to the suction piping of the engine.

[redacted]

Exhaust manifold on the engine.
Exhaust silencer.
1 exhaust thermometer for each cylinder.

[redacted]

for fixing the engine to brick or concrete foundations.

[redacted]

on a board, and special tools.

[redacted]

Directly driven, fitted to the engine.

[redacted]

Each cylinder head carries one thermometer indicating the outlet water temperature.

**PRESSURE AIR BOTTLE** for starting, with fittings and piping. Capacity for 3—4 cylinder engines 150 litres (33 galls), for 5—6 cylinder engines 200 litres (44 galls), for 8 cylinder engines 300 litres (60 galls)

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galls)

**SET OF SPARE PARTS SUPPLIED WITH THE ENGINE AND INCLUDED IN THE ENGINE PRICE**

**Valve with guide,** 1 piece for each second cylinder (the suction and exhaust valves are identical and therefore interchangeable).

**Piston pressure rings,** 3 for each cylinder.

**Piston scraper rings,** 1 for each second cylinder.

**Injection nozzle,** 1 for each cylinder.
1 set of springs (containing one piece of each size),
1 set of packings (containing one piece of each size),
1 set of bolts and nuts (approx. 10% of the total quantity on the engine),
1 fuel oil filter element.

**For injection pump:**
Piston with barrel, delivery valve with packing and springs, 1 for each second cylinder.
Cap nut with threading ring, 1 for each cylinder.
Injection tube with cap nuts and threading rings, 1 for each second cylinder.

**SPECIAL EQUIPMENT AND ACCESSORIES SUPPLIED AT EXTRA CHARGE**

1. **Shaft extension** with connection, external bearing and belt pulley.
2. **Compressor** with electric or Diesel drive, for charging the air bottles.
3. **Cooling water pump** with suction and delivery piping. (When ordering please state the distance from water level to the shaft axis of the engine.)
   **Cooling water tank,** equipment for the cooling water.
4. **Exhaust piping.**
5. **Outdoor storage fuel tank, fuel transfer pump from the storage tank to the service tank, pump for filling the storage tank, with necessary piping and fittings. Equipment for fuel preheating.**
6. **Equipment for cleaning and reconditioning lubricating oil.**
7. **Electric remote governor control from the switchboard.**
8. **Other engine room equipment.**

**ILLUSTRATIONS ARE APPROXIMATE ONLY AND WE RESERVE THE RIGHT TO MAKE MODIFICATIONS AND IMPROVEMENTS OF DESIGN WHICH, FROM TIME TO TIME, MAY BE DEEMED NECESSARY.**

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40° C (72° F). The quantity of cooling water required increases and decreases proportionately with varying water temperature rises. The temperature of the discharged water must not exceed 60° C (140° F). If the hardness of the water exceeds 5 mg $CaCO_3$ in 100 $cm^3$ (3.5 grains per gallon), water softening plant should be installed or indirect cooling applied. We shall be pleased to supply suitable equipment at extra charge.

[redacted]

Flywheel on right hand end, looking at the valve gear side. Rotation clockwise, looking at the flywheel end.

[redacted]

| | |
|---|---|
| Cylinder bore | 275 mm 10⅞" |
| Piston stroke | 360 mm 14¼" |
| Compression pressure | 35 kg/sq. cm (498 lbs sq. inch) |
| Combustion pressure | 50 kg/sq. cm (712 lbs sq. inch) |
| Exhaust temperature at full load | 400° C (752° F) |
| Ins. dia. of exhaust pipe | 150 mm (5¾") |

[redacted]

Engines can be supplied for direct coupling or with coupling and pulley. Marine engines, engines for well boring, for railway purposes, etc. are described in separate leaflets.

[redacted]

Standard flywheels give a cyclic irregularity of

| with | 1 : 140 | 1 : 225 | 1 : 112.5 | 1 : 281 | 1 : 231 |
|---|---|---|---|---|---|
| | 3 | 4 | 5 | 6 | 8 cylinders. |

rated with pressure

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alues are understood
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from those specified

, the engine output

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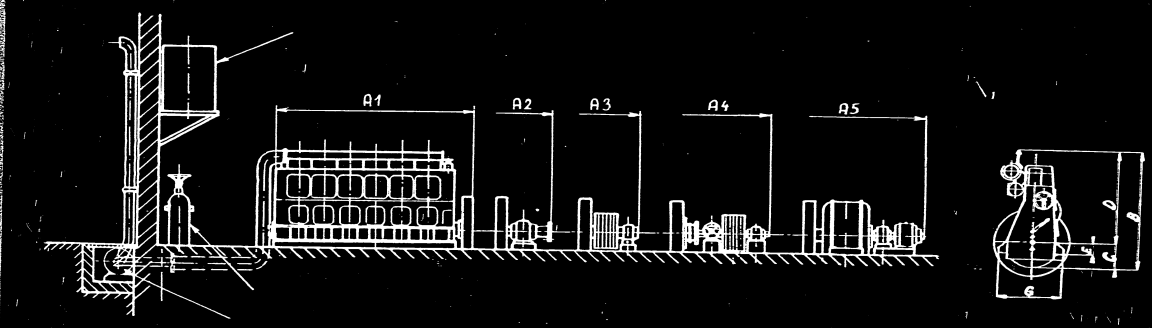
Cylinder 8 S 275 Engine

300

ake Horse Power




## APPROXIMATE DIMENSIONS

| Type | | A1 engine with flywheel | A2 engine with outer bearing | A3 engine with pulley | A4 engine with coupling | A5 engine with alternator | Overall width | Overall height B | Crane hook height | E | C | D | Flywheel dia. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 3 S 275 | mm | 2310 | 3010 | 3190 | 3900 | 3790 | | | | | | | 1380 |
| | inch | 7'7" | 10' | 10'6" | 12'10" | 12'5" | | | | | | | 4'6" |
| 4 S 275 | mm | 2770 | 3470 | 3640 | 4610 | 4380 | | | | | | | 1380 |
| | inch | 9'1" | 11'5" | 11'11" | 15'2" | 14'4" | | | | | | | 4'6" |
| 5 S 275 | mm | 3220 | 3920 | 4090 | 5270 | 4830 | 1000 | 3085 | 2700 | 225 | 490 | 1615 | 1380 |
| | inch | 10'7" | 12'10" | 13'5" | 17'4" | 15'10" | 3'3⅜" | 6'10" | 8'10" | 8⅞" | 1'6⅜" | 5'3⅝" | 4'6" |
| 6 S 275 | mm | 3670 | 4370 | 4540 | 5860 | 5320 | | | | | | | 1380 |
| | inch | 12' | 14'5" | 14'11" | 19'3" | 17'6" | | | | | | | 4'6" |
| 8 S 275 | mm | 4570 | 5270 | 5440 | 7000 | 6320 | | | | | | | 1380 |
| | inch | 15' | 17'4" | 17'10" | 23' | 20'9" | | | | | | | 4'6" |

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[redacted]

[redacted]

Vertical enclosed four stroke Škoda Diesel Engine with direct airless injection, normally aspirated with pressure lubrication.

[redacted]

BSS 649.1949

[redacted]

The output values shown in the table on page 1 are twelve-hour rated values at 500 r. p. m.*) It is possible to overload the engine by 10% for a period of 1 hour and by 20% for a short period. These rated values are understood under the following conditions: atmospheric pressure of 749 mm Hg., i. e. 29,5 inches of mercury, at engine room temperature of 29.4° C, i. e. 85° F and a humidity equal to a mercury vapour pressure of 15 mm, i. e. 0.6". The continuous output is 90% of the mentioned rated output. If the engine works under conditions differing from those specified above, the output alters as follows:

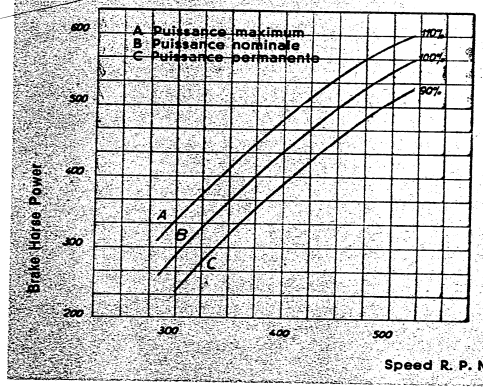
a) For each decrease or increase of barometric pressure by 6.35 mm, i. e. ¼ inch mercury, the engine output decreases or increases by 1%.

b) For each temperature increase by 2.8° C, i. e. 5° F, the engine output decreases by 1%.

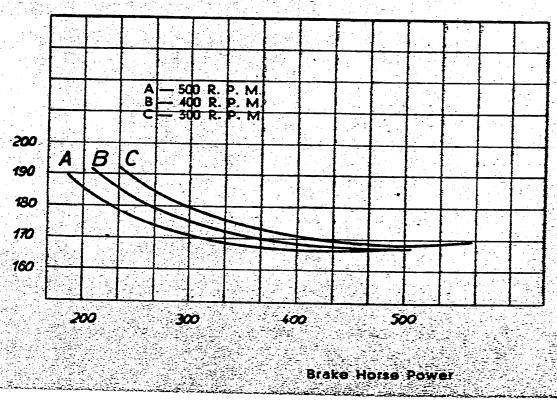
c) At humidities above 15 mm, i. e 0.6" mercury the output drops by 1% for a vapour pressure increase by 6.35 mm, i. e. ¼ inch mercury.

*) The normal speed for this type of engine is 500 R. P. M. These engines can also run at other speeds and corresponding changed output (see following diagram).

**Maximum Rated and Continuous Performance Curves of Eight Cylinder 8 S 275 Engine.**




**Fuel Consumption Curves for Eight Cylinder 8 S 275 Engine**




[redacted]

| at | 100% | 75% | 50% | of the rated output |
|---|---|---|---|---|
| gr/B. H. P. h. | 167 | 172 | 188 | |
| lbs/B. H. P. h. | 368 | 379 | 414 | |

subject to tolerance of 5% when using fuel of a suitable grade having a gross calorific value of 10.750 Kcal kg (19.350 B. T. U.'s per lb).

[redacted]

At rated engine output make up oil consumption is 2.5 gr/H. P. h. (.0055 lbs H. P. hour), subject to a tolerance of 10%. Škoda Diesel Engines may be run on appropriate good quality fuel and lubricating oil commonly used for oil engines.

Each engine is tested in our works at rated load and overload and the obtained fuel and lubricating oil consumption values are put on record and certified.

[redacted]

The quantity of cooling water required is 18 litres (4 galls.) per H. P. hour at rated output with a temperature rise of

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The design of the Diesel engines Škoda is very advanced and in all respect in line with the requirements and purposes for which they are intended. This is the result of a 30 year tradition in oil engine building.
The engine is efficient and reliable and has proved successful in heavy duty operation due to the careful choice of thoroughly tested materials and to precision machining of all parts by means of modern production methods. The same applies to spare parts, also made of high quality material and machined strictly within the respective tolerance.

[redacted]

The lower part of the cast iron casing is of sturdy design and houses the main bearings. The cast iron part accommodates the cylinder liners and is provided with large side doors giving access to the crank mechanism. The wet liners are fixed at the top by the cylinder head and are free to expand downwards. They can be replaced easily.

[redacted]

The crankshaft, forged in the world known Škoda Forges, from material of high tensile strength and toughness, is made of one single forging. The main bearings are of steel, white metal lined, and pressure lubricated.

[redacted]

The forged connecting rods have an "H" section. The split big end bearing is lined with white metal and bolted to the connecting rod. By inserting shims the distance between the two bearings can be adjusted. The small end is unsplit and has a steel bush with lead-bronze lining.

[redacted]

The pistons are made either of a special cast iron or of aluminium alloy and are fitted with 5 pressure and 2 scraper rings. The gudgeon pins are of the floating type made of high grade case hardened and ground steel.

[redacted]

The cylinder heads accommodate interchangeable suction and exhaust valves. The valves are operated from the camshaft by push-rods and rocker arms. The camshaft is driven from the main shaft by means of bevelled toothed spur gears. An injection valve of the closed type with multi-hole nozzle is in the centre of each cylinder head, ensuring perfect atomizing and combustion of the fuel and, as a result, low fuel consumption. Each cylinder head has a safety valve.

[redacted]

A separate fuel injection pump individually adjustable is provided for each cylinder. The fuel is cleaned by means of a laminated filter accommodated in the fuel supply piping, and by means of a dual filter with felt filtering elements on the engine before the injection pump.

[redacted]

The centrifugal governor adjusts hydraulically by means of a servomotor the quantity of injected fuel by changing the end of the injection period only. Adjustment of the speed between $\pm$ 10% during operation of the engine is possible by setting the governor by hand.

[redacted]

A circulating pressure oil lubricating system ensures perfect lubrication of all moving parts. The geared oil pump with adjustable by-pass valve draws lubricating oil from the tank and delivers it over a laminated filter and oil cooler to all lubricated spots from which the oil flows back to the sump and from there again into the oil tank.

[redacted]

The cooling water is circulated through the cylinder jackets and heads and then through the exhaust manifold jecket either back to a cooler or to the discharge.

[redacted]

The engine is started by compressed air supplied from an air bottle through a distributor admitting compressed air to the cylinders in the correct order. The air supply to the distributor is controlled by a hand wheel operated valve which simultaneously adjusts the governor rods of the fuel pump.
The engine can be started instantly from cold and takes up loads in a few seconds.

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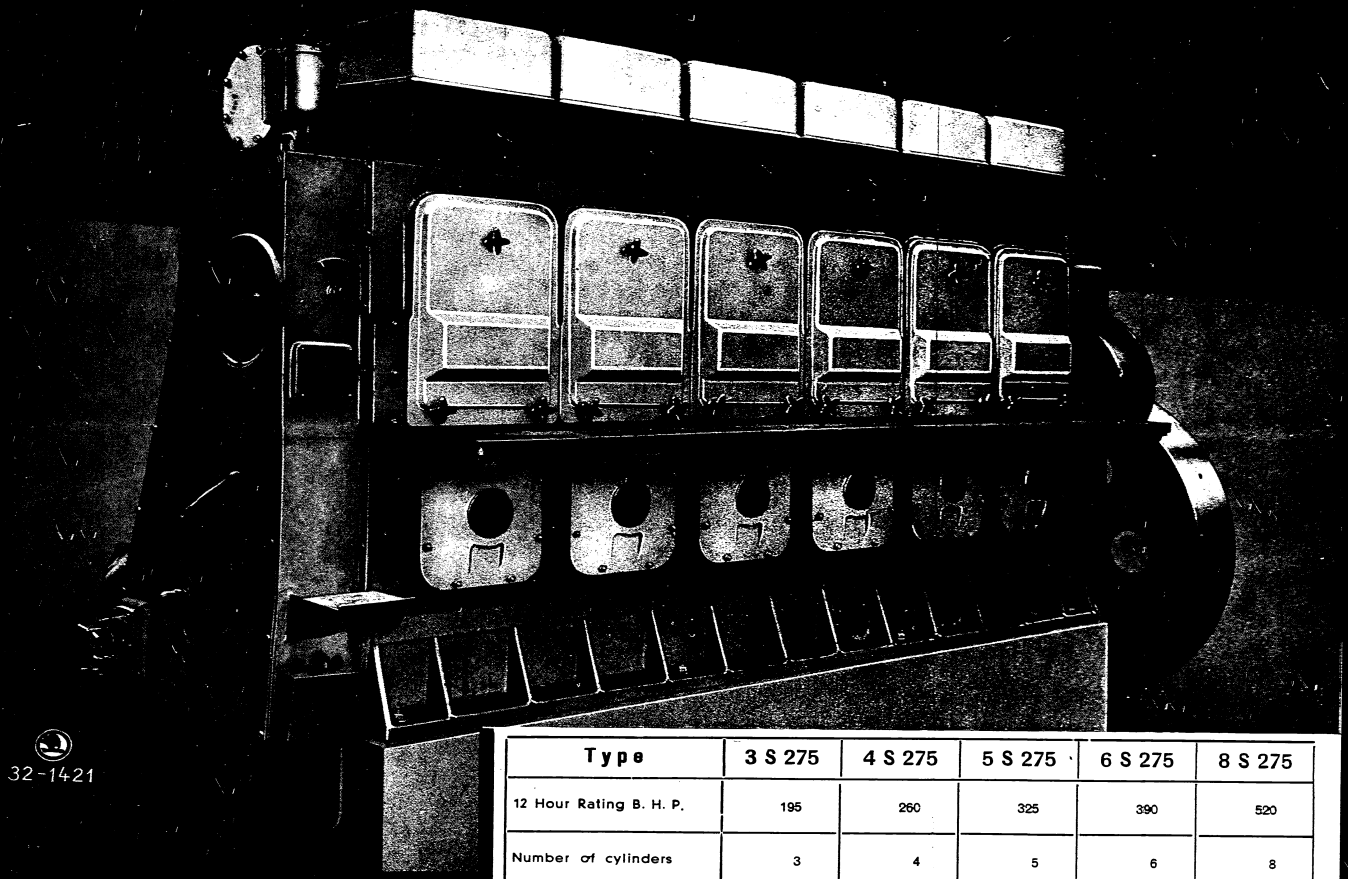
ŠKODA

# INDUSTRIAL DIESEL-ENGINES

| Type S 275 | |
|---|---|
| Output | 195—520 B. H. P. |
| Number of Cylinders | 3—8 |
| Bore | 275 mm (10⅞″) |
| Stroke | 360 mm (14¼″) |
| Speed | 500 R. P. M. |



32-1421

| Type | 3 S 275 | 4 S 275 | 5 S 275 | 6 S 275 | 8 S 275 |
|---|---|---|---|---|---|
| 12 Hour Rating B. H. P. | 195 | 260 | 325 | 390 | 520 |
| Number of cylinders | 3 | 4 | 5 | 6 | 8 |
| Net weight (incl. standard accessories) kilos | 7 100 | 8 000 | 9 200 | 10 400 | 12 700 |
| lbs | 15 600 | 17 600 | 20 200 | 22 900 | 27 900 |
| Gross weight (railway packing) kilos | 8 300 | 9 300 | 10 700 | 12 100 | 14 800 |
| lbs | 18 300 | 20 400 | 23 500 | 26 400 | 32 500 |
| Gross weight (seaworthy packing) kilos | 8 500 | 9 600 | 11 000 | 12 400 | 15 200 |
| lbs | 18 700 | 21 100 | 24 200 | 27 300 | 33 400 |
| Shipping space cu. metres | 15,2 | 16,5 | 20 | 22 | 29,5 |
| cu. ft. | 537 | 583 | 706 | 777 | 1 040 |

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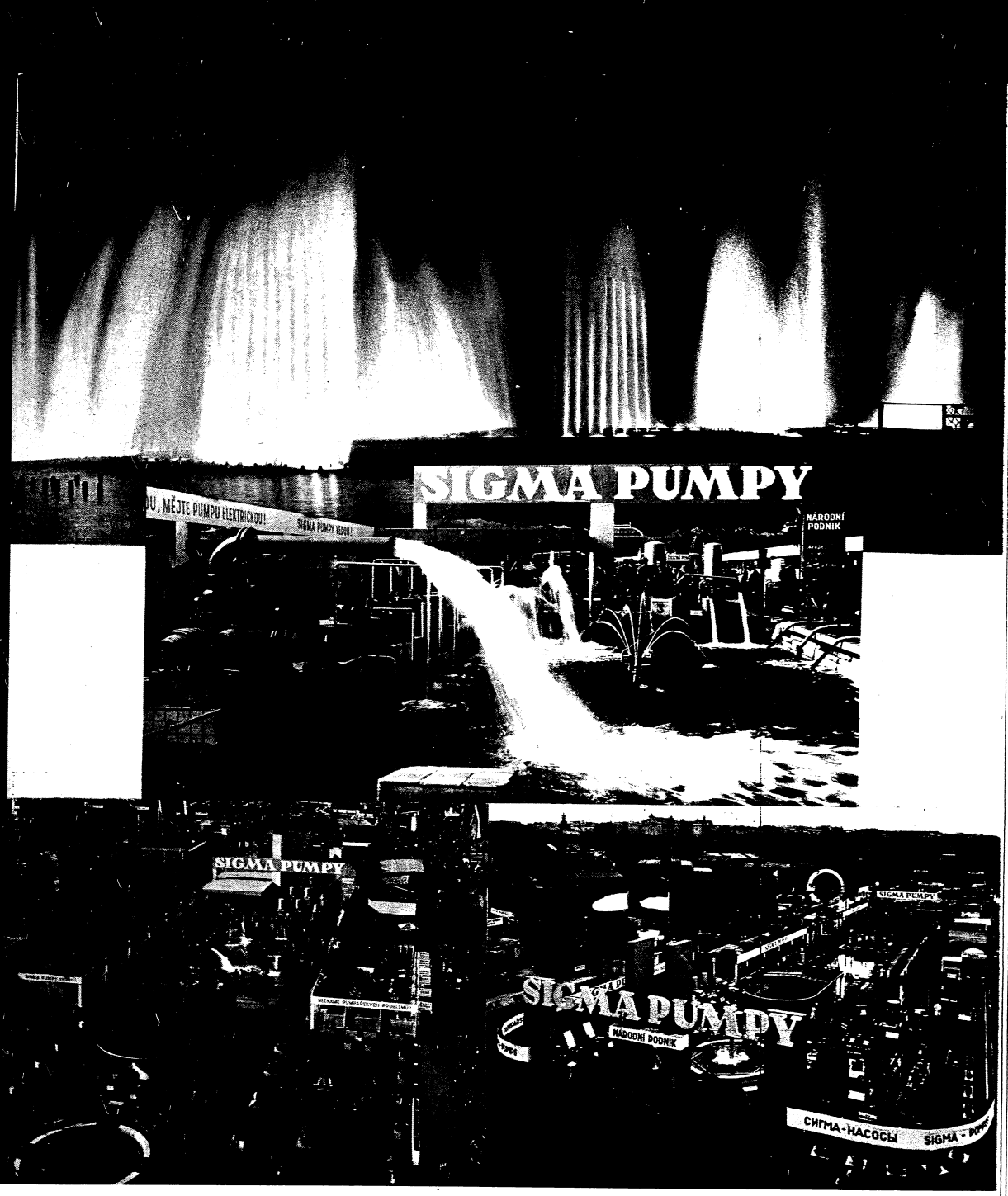


Aerial Views of our Stands at the Prague Annual Fairs

Illustration No 14

# SIGMA PUMPS

## NATIONAL CORPORATION OLOMOUC CZECHOSLOVAKIA

001-02/A

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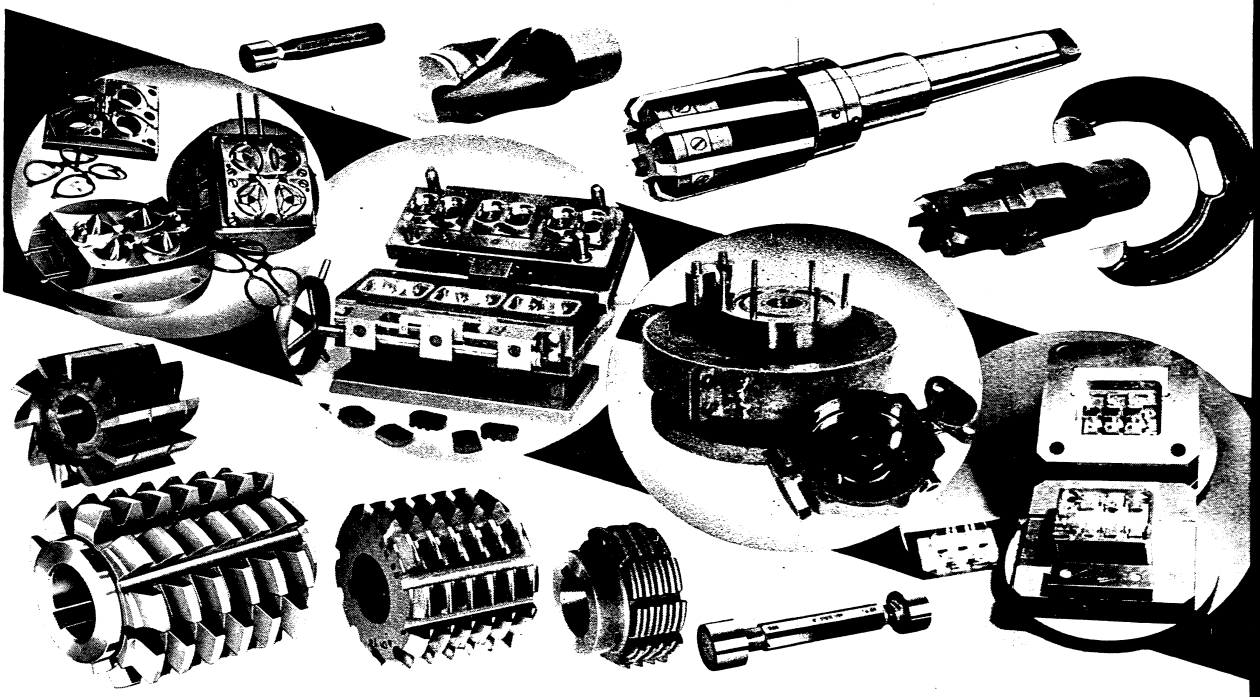
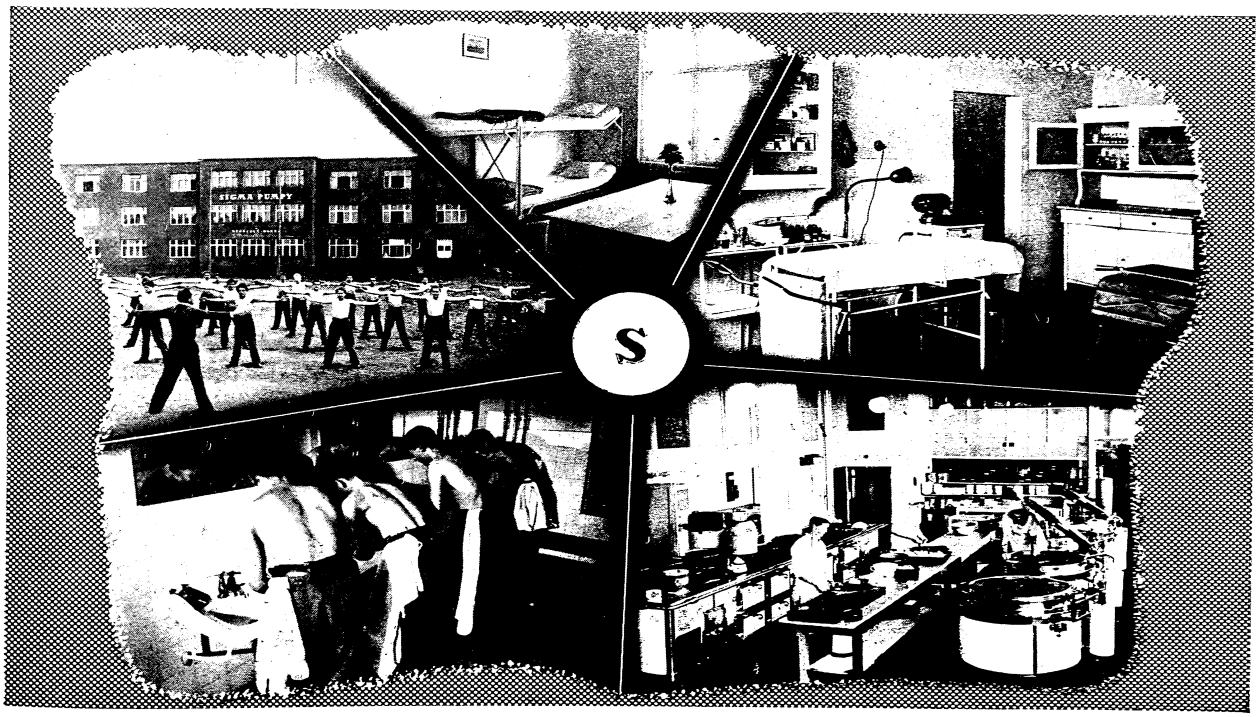


Examples of our Machine Tool Room Production

Illustration No 12




Social Activities and Welfare facilities in our Factory

Illustration No 13

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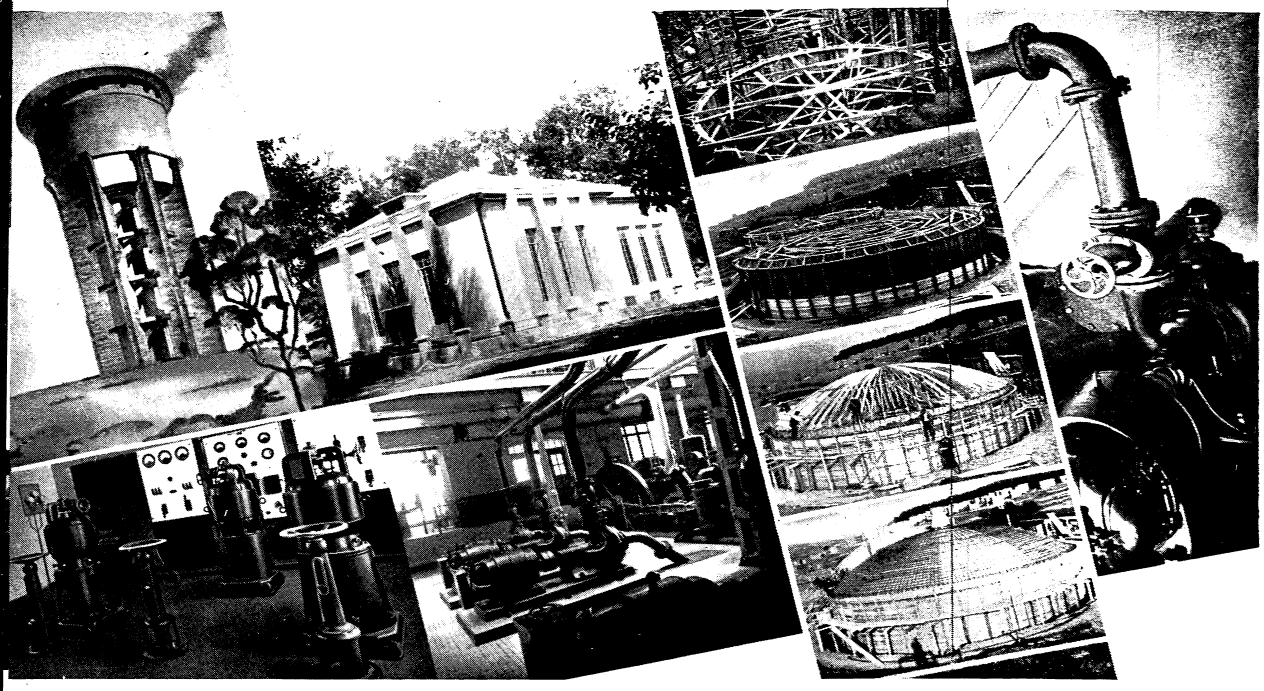
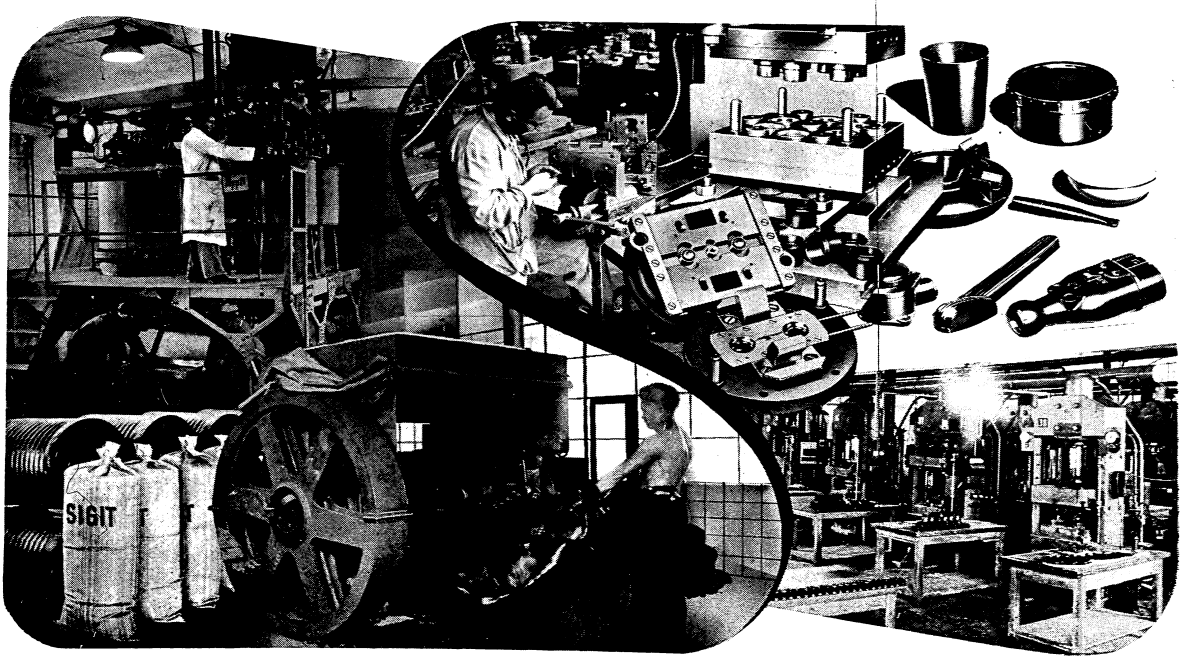


Views of Water Supply Plants Built and Equipped by Sigma Pumps

Illustration No 10




Views of our Plastic Production (Plastic Material, Precision Moulds and Finished Products)

Illustration No 11

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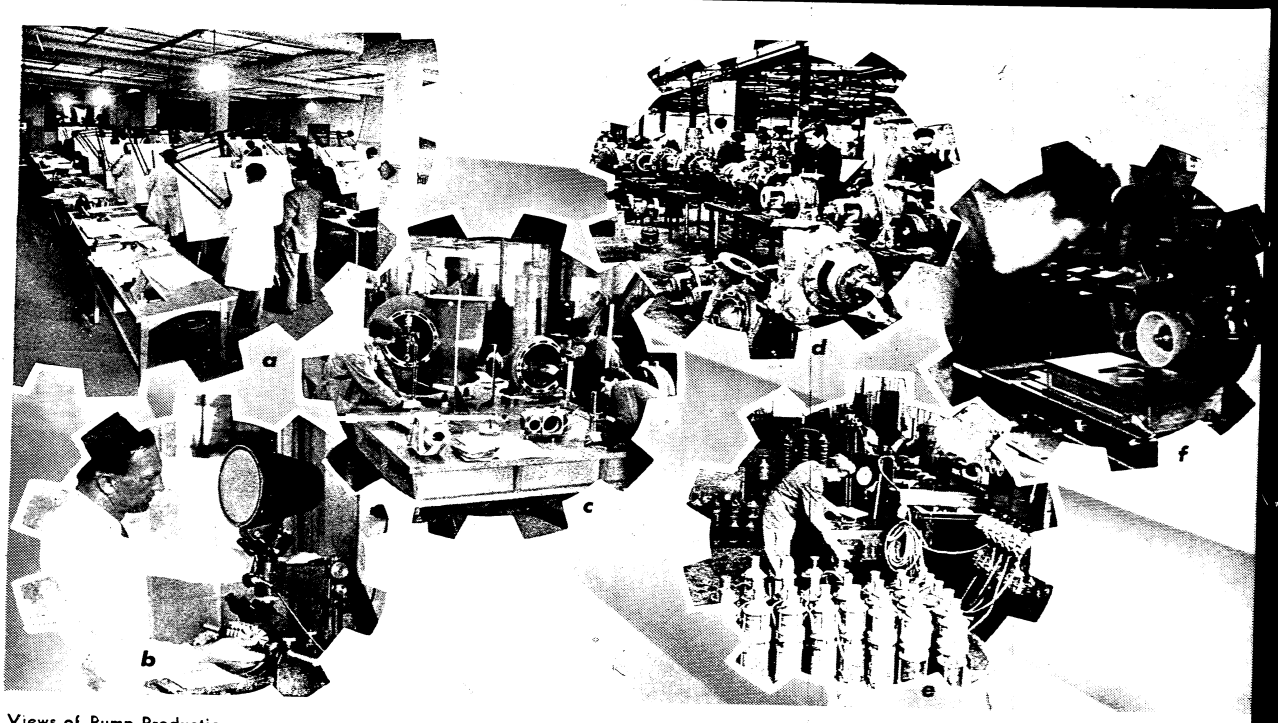
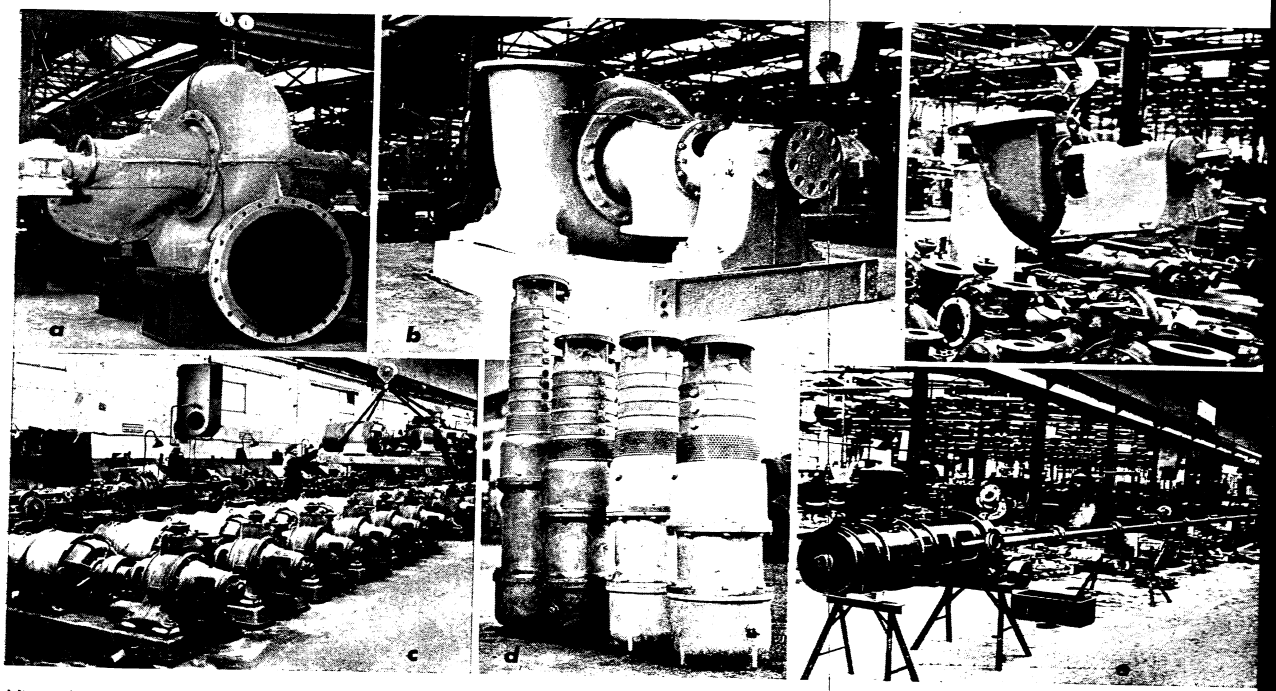


**Views of Pump Production**

Illustration No 8

**a** View of Drawing Office • **b** View of Inspection Room – Profile Checking • **c** Marking of Large Pump Components • **d** Assembly Line of "H" Pumps • **e** Hydraulic and Electric Testing of Submersible Pumps • **f** Precision Grinding of Inspection Gauges



**View of some Large Capacity Horizontal, Vertical and Submersible Deep Well Pumps in Assembly**

Illustration No 9

**a** Large Capacity Horizontally Split "QG 15" Pump • **b** Assembled Double-entry Large Capacity "QA-13" Pump • **c** Series of "H" Medium Pressure Pumps • **d** Large Submersible Pumps in our Works • **e** Vertical Deep-well Pump being assembled

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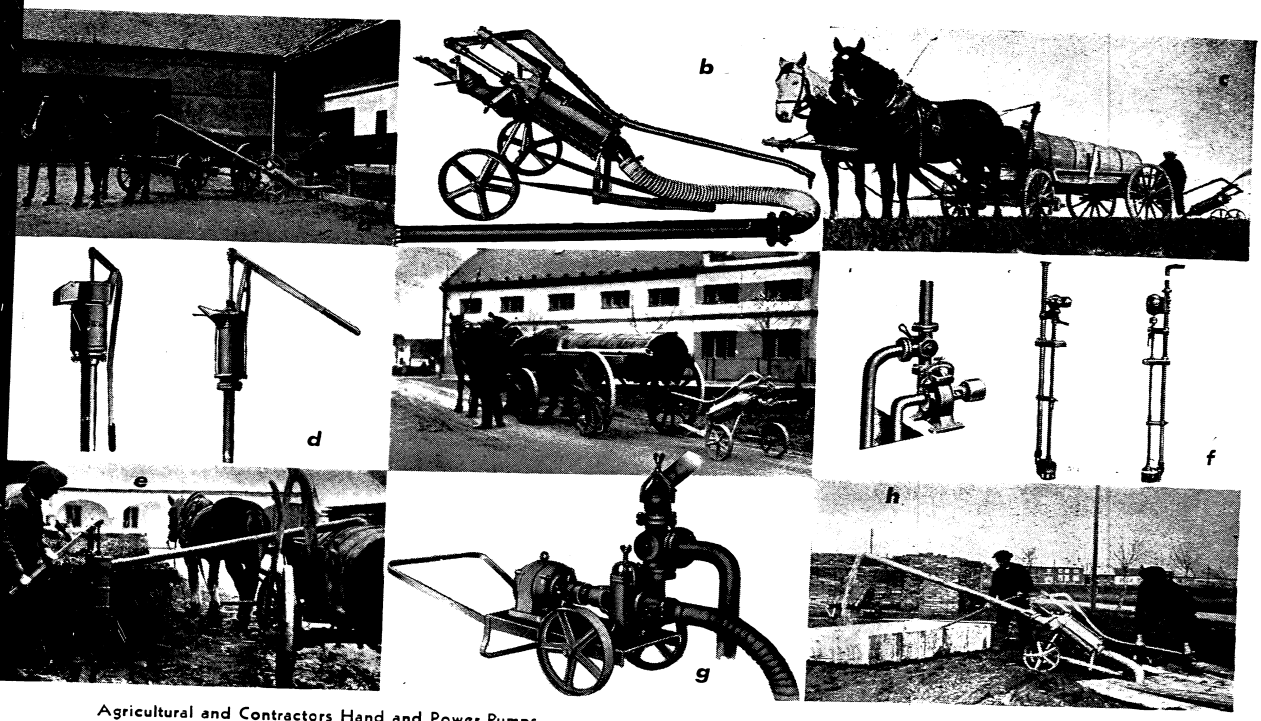
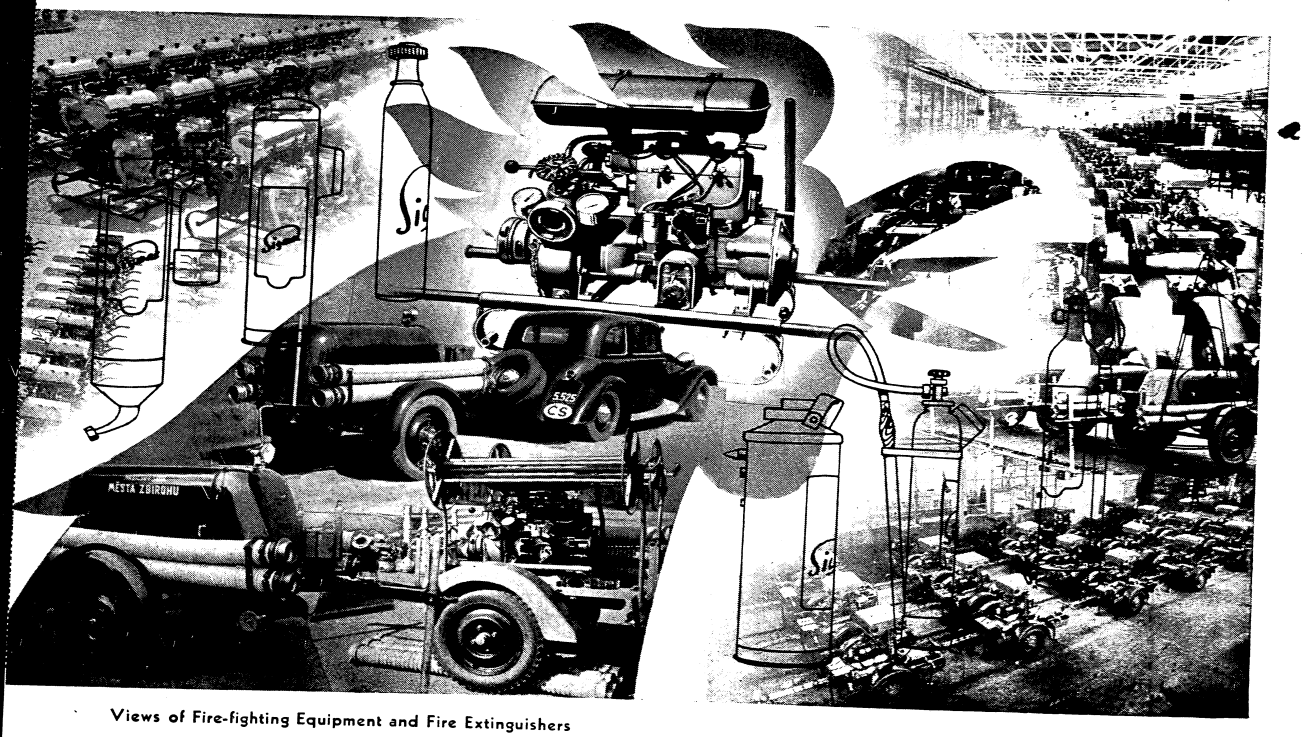



**Agricultural and Contractors Hand and Power Pumps**

Illustration No 6

***a*** Filling cart by "RAKETA" Universal Hand Pump • ***b*** "RAKETA" Universal Hand Pump • ***c*** Spraying Manure by "RAKETA" Universal Hand Pump • ***d*** "DINGA" and "TALVA" Manure Hand Pump • ***e*** "TALVA" Manure Hand Pump in operation • ***f*** "EPOCHAL-H-R" Centrifugal Pump for Manure and Sewage "EPOCHAL-V-R" and "EPOCHAL-V-FE" • ***g*** "EPOCHAL H-FE" Pump mounted on a two-wheeled truck • ***h*** "RAKETA" on building site




**Views of Fire-fighting Equipment and Fire Extinguishers**

Illustration No 7

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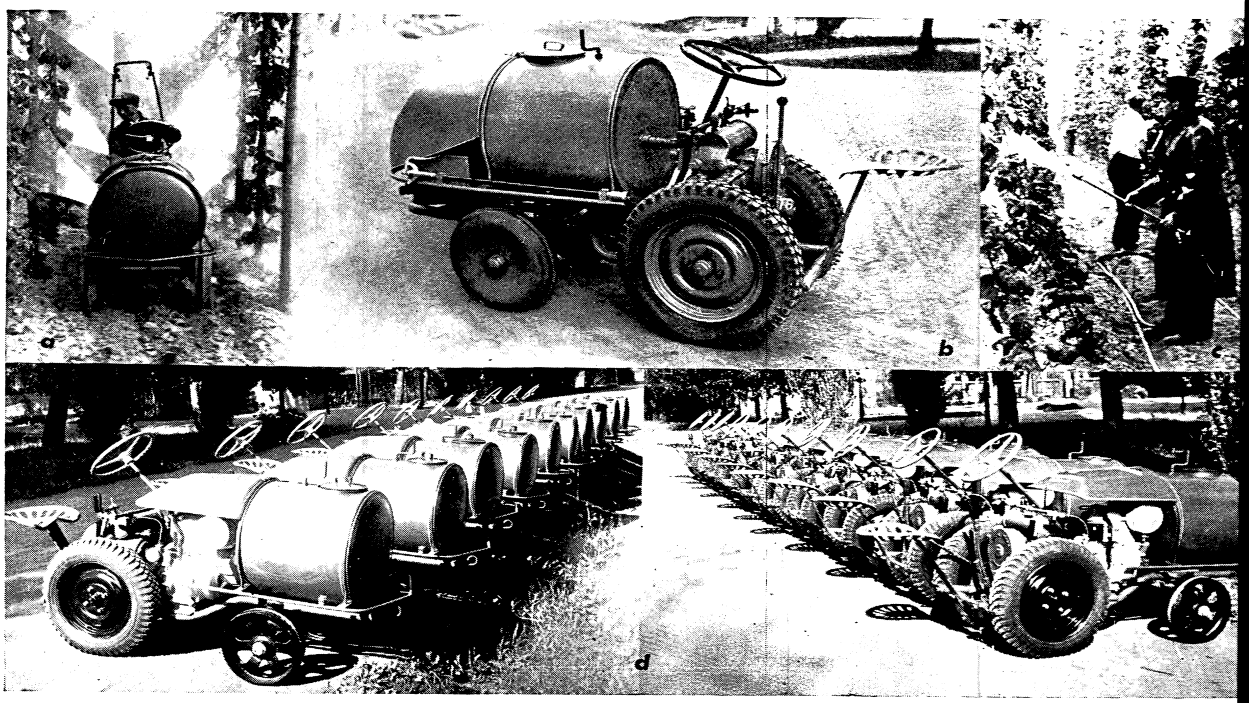
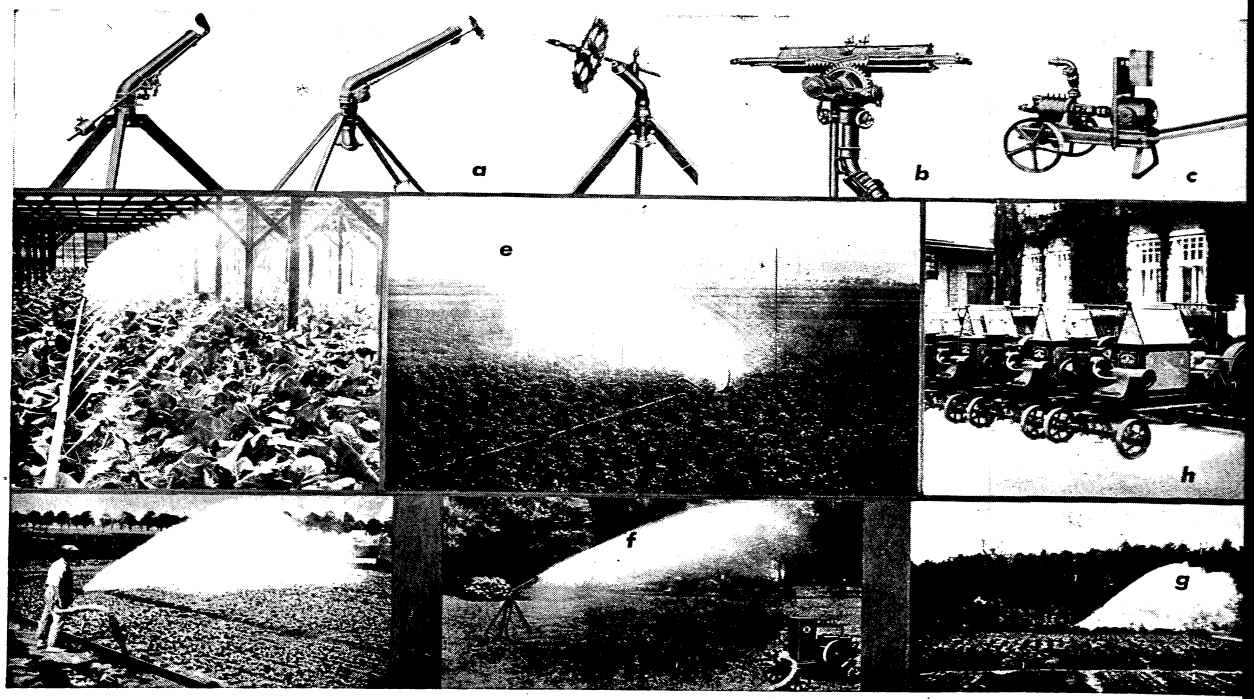



**Self-propelled "AUTOFENOMEN" Plant Sprayers** Illustration No 4

***a*** "AUTOFENOMEN" operating in a Hop-field • ***b*** "AUTOFENOMEN" • ***c*** Spraying with Hand-piece and Nozzle • ***d*** "AUTOFENOMEN Units ready for dispatch




**Artificial Overhead Irrigation** Illustration No 5

***a*** Rotary Garden and Lawn Sprinklers • ***b*** Automatic Oscillator for Spray-line • ***c*** Small Hand-propelled Pumping Unit for Irrigation • ***d*** Spray-line in Glasshouse • ***e*** Rotary Sprinkler operating on Potato Crop • ***f*** Rotary Sprinkler with Diesel-driven Pump • ***g*** Rotary Sprinkler in Vegetable Cultivation • ***h*** Irrigation Units ready for dispatch

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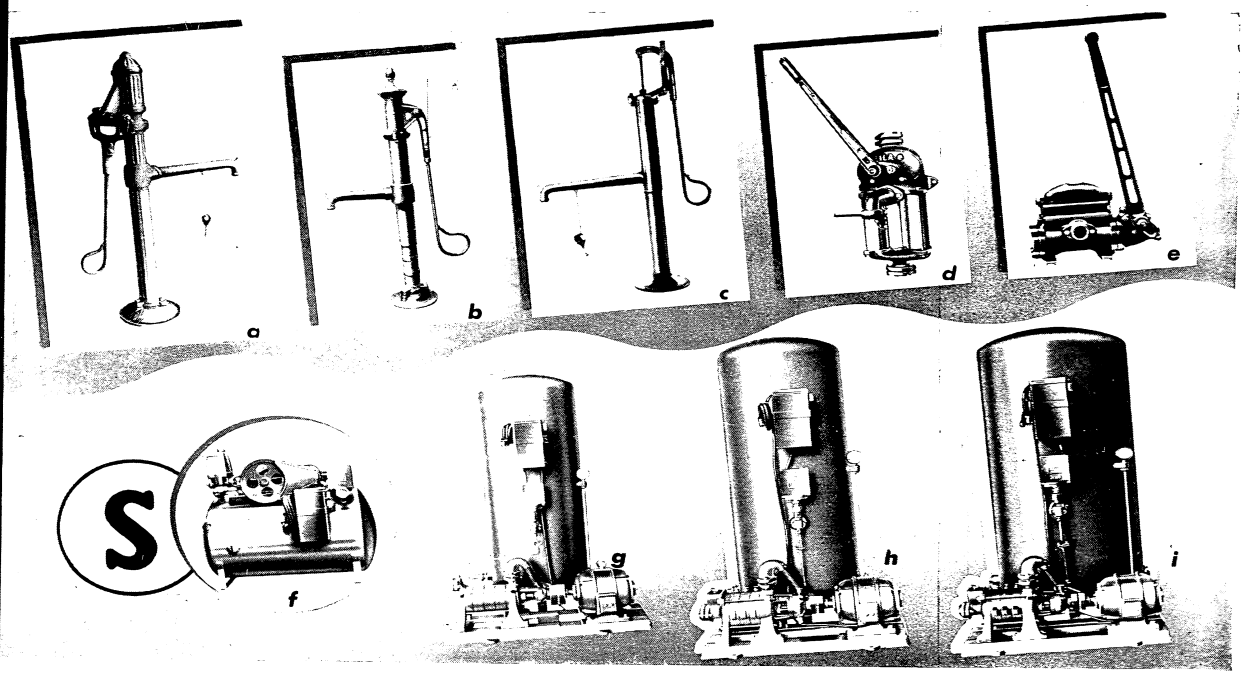
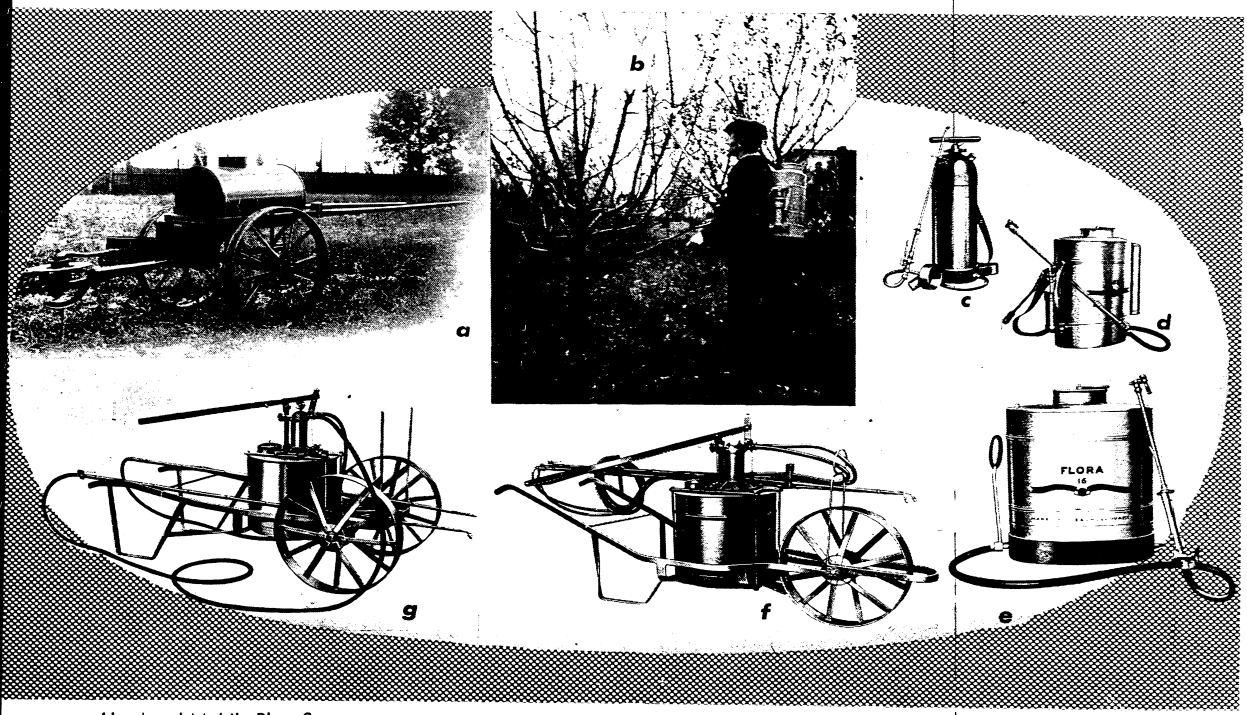



**Hand and Stand Pumps and Automatic Water Supply Systems** Illustration No 2

***a*** "DURAL" Stand Pump • ***b*** "STANDARD" Stand Pump • ***c*** "STS" Stand Pump • ***d*** "LILA" Hand Pump • ***e*** "MOSTAR" Hand Pump • ***f*** "DARLING-MOSTARET" Automatic House-Water System • ***g*** "DARLING-KONTES" Automatic House-Water System ***h*** "DARLING-SENIOR" Automatic House-Water System • ***i*** "DARLING-SUPERIOR" Automatic House-Water System




**Hand and Mobile Plant Sprayers** · Illustration No 3

***a*** Horse-drawn "AZOTA" Sprayer for Potato Crops etc. • ***b*** "FLOXA 16" Portable Sprayer in Operation • ***c*** "FAMOSA 22" Sprayer ***d*** "FLOXA16" Portable Sprayer • ***e*** "FLORA 16" Portable Sprayer • ***f*** "FORTUNA Z 60" Hand-propelled Sprayer • ***g*** "FORTUNA ZZ 60" Hand-propelled Sprayer

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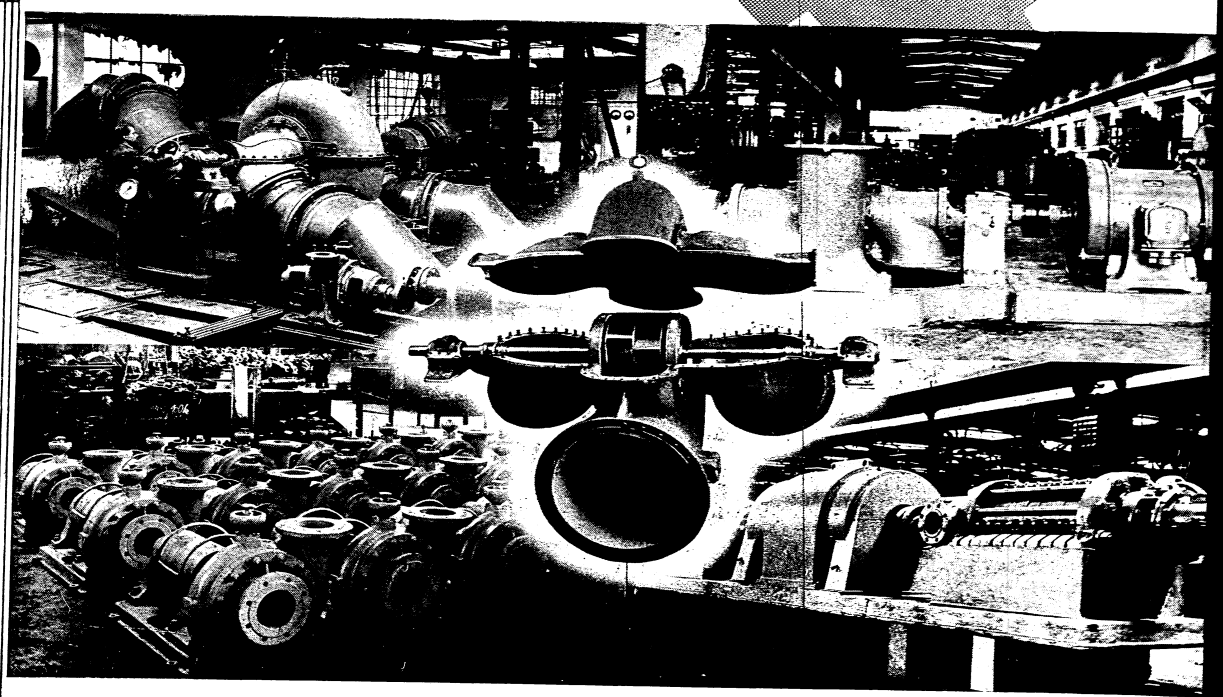
# Review of MANUFACTURING PROGRAMME

**SIGMA PUMPS**
**NATIONAL CORPORATION**
**OLOMOUC CZECHOSLOVAKIA**



General View of a few of our Large Capacity and High Pressure Pumps

Illustration No 1

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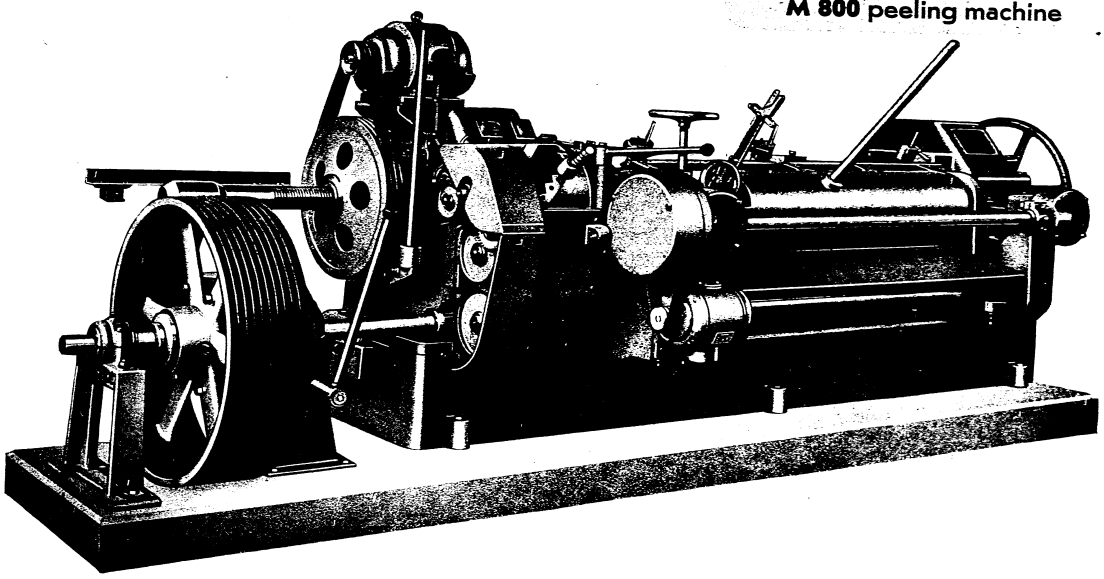
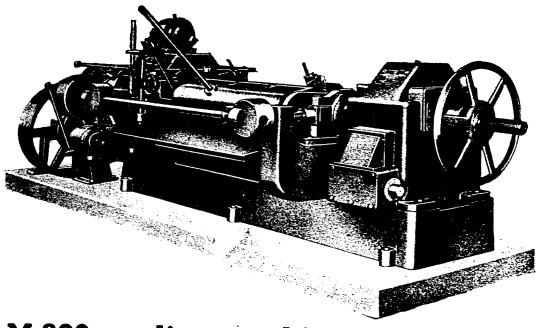
**M 800 peeling machine**



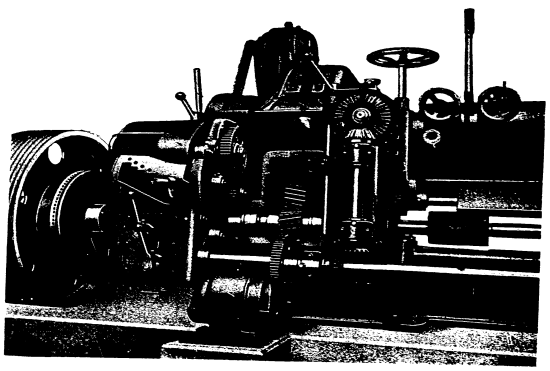


| | | | | |
|---|---|---|---|---|
| 0.20 | 0.30 | 0.40 | 0.50 | 0.60 |
| 0.25 | 0.37 | 0.50 | 0.62 | 0.75 |
| 0.40 | 0.60 | 0.80 | 1.01 | 1.21 |
| 0.99 | 1.48 | 1.98 | 2.47 | 2.97 |
| 1.60 | 2.40 | 3.20 | 4.00 | 4.81 |
| 1.12 | 1.67 | 2.23 | 2.79 | 3.35 |
| 1.81 | 2.71 | 3.62 | 4.52 | 5.43 |
| 1.98 | 2.97 | 3.95 | 4.95 | 5.93 |

This type has a mechanism for precise adjustment of the presser strip for one veneer thickness only and does not contain the double thickness mechanism.
Starting and stopping is effected by a hand operated friction clutch.

## M 800 peeling machine

For obtaining various thicknesses of peeled veneers the machine is equipped with a 5 speed Norton gear box and a set of exchangeable gears. This provides a selection of peeling thicknesses ranging from 0.2 to 6 mm as seen in the table below:



Quick chauge gearbox of the 1300 Peeling Machine

M 800 peeler is manufactured in two sizes:

| | | |
|---|---|---|
| Peeling knife length | 1,800 mm; 71″ | 1,500 mm; 59″ |
| Maximum dia. of log | 800 mm; 31½″ | 800 mm; 31½″ |
| Minimum peeling length without extension spindles | 1,300 mm; 51″ | 1,000 mm; 39⅜″ |
| Diameter of clamping spindles | 90 mm; 3½″ | 90 mm; 3½″ |
| Minimum thickness of peeled veneer | 0.2 mm; 0.008″ | 0.2 mm; 0.008″ |
| Maximum thickness of peeled veneer | 6 mm; 0.236″ | 6 mm; 0.236″ |
| Clamping spindle revolutions | 30—60 per min. or more when ordered | 30—60 per min. |
| Weight of machine inclusive of all previously listed equipment | 8,100 kg; | 17,860 lbs. |
| | 6,730 kg; | 14,840 lbs. |
| Weight in ordinary packing | kg | |
| Weight in seaworthy packing | kg | |
| Carriage space | m³ | |

Besides the machines listed in this prospectus we manufacture peelers of other sizes up to a diameter of 2,000 mm (78⅘″) and a length of knife 3,400 mm (118″).

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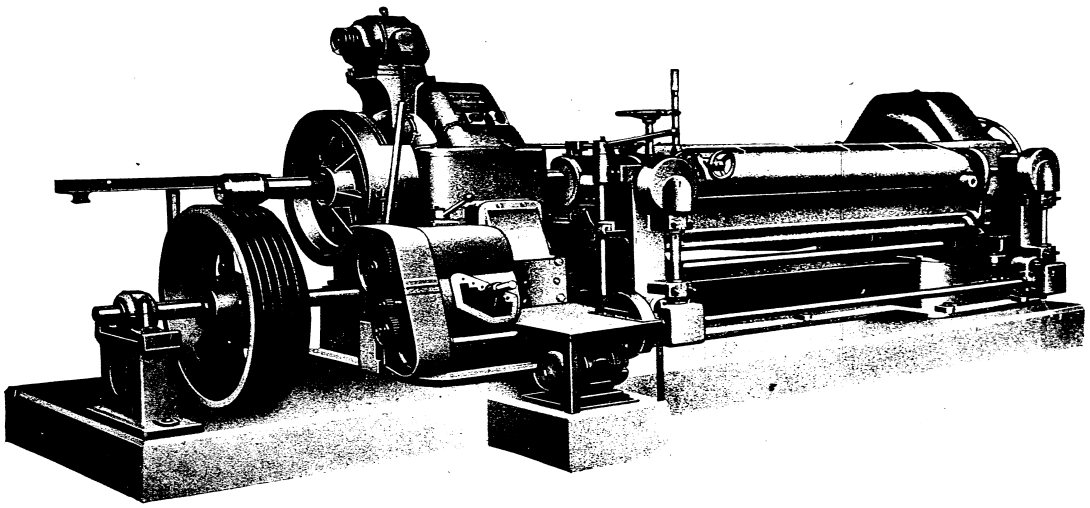
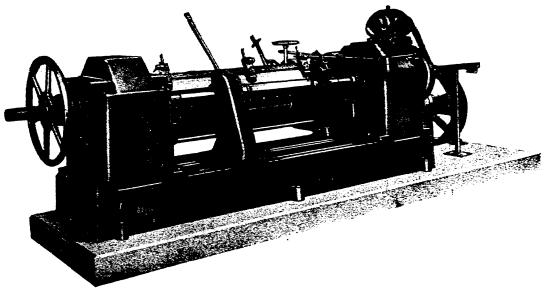
## S 1300 peeling machine



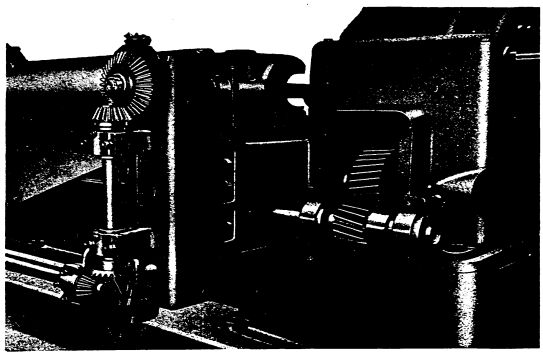


| | | | | | |
|---|---|---|---|---|---|
| 0.20 | 0.25 | 0.30 | 0.35 | 0.40 | 0.45 |
| 0.40 | 0.50 | 0.60 | 0.70 | 0.80 | 0.90 |
| 0.80 | 1.00 | 1.20 | 1.40 | 1.60 | 1.80 |
| 1.60 | 2.00 | 2.40 | 2.80 | 3.20 | 3.60 |
| 0.40 | 0.50 | 0.60 | 0.70 | 0.80 | 0.90 |
| 0.80 | 1.00 | 1.20 | 1.40 | 1.60 | 1.80 |
| 1.60 | 2.00 | 2.40 | 2.80 | 3.20 | 3.60 |
| 3.20 | 4.00 | 4.80 | 5.60 | 6.40 | 7.20 |

The peeler is provided with an attachment for instantaneous setting up of the presser strip for two different thicknesses of veneers by simply shifting a lever. Both positions required can be pre-set by means of two handwheels.
This type is also equipped with a mechanical friction clutch which guarantees absolutely reliable disengaging of the machine by a hand lever.

## M 1300 peeling machine

The principal feature of this machine is its Norton gear box with 6 speeds and the mechanism for doubling the peeled thickness. By using two pairs of change gears the following thicknesses of veneers are obtained:



Detail of gears of the knife beam

**Technical data**

| | |
|---|---|
| Peeling knife length | 2,400 mm; 94 1/2" |
| Maximum diameter of log | 1,300 mm; 51" |
| Minimum peeling length without extension spindles | 1,900 mm; 75" |
| Diameter of clamping spindles | 130 mm; 5" |
| Minimum thickness of peeled veneer | 0.2 mm; 0.008" |
| Maximum thickness of peeled veneer | 7.2 mm; 0.283" |
| Clamping spindle revolutions | 15—45 per min. |
| Capacity of motor required for main drive | 35 HP, 500—1,500 r. p. m. |
| Approximate motor capacity for driving the left clamping spindle | 4.5 HP at 960 r. p. m. |
| Motor capacity required for increased feed of the beam | 3,8 HP at 960 r. p. m. |
| Weight of machine inclusive of all previously listed equipment | 14,100 kg; 31,090 lbs. |
| Weight in ordinary packing | kg |
| Weight in seaworthy packing | kg |
| Carriage space | $m^3$ |

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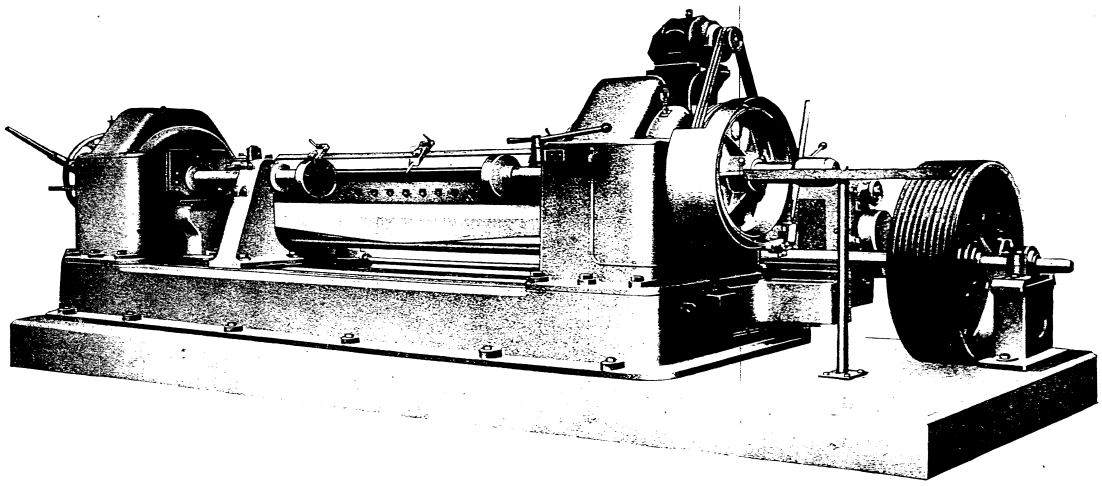
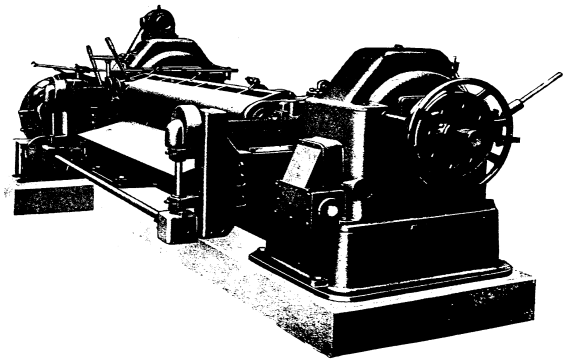
# S 1300 peeling machine



**Gear wheel with 70 teeth:**

| | | | | | | |
|---|---|---|---|---|---|---|
| 1.61 | 2.01 | 2.41 | 2.81 | 3.21 | 3.62 | 4.01 |
| 1.00 | 1.25 | 1.50 | 1.76 | 2.01 | 2.26 | 2.51 |
| 0.64 | 0.80 | 0.96 | 1.25 | 1.28 | 1.45 | 1.61 |
| 0.40 | 0.50 | 0.60 | 0.70 | 0.80 | 0.90 | 1.00 |
| 0.80 | 1.00 | 1.21 | 1.41 | 1.61 | 1.81 | 2.01 |
| 0.50 | 0.63 | 0.75 | 0.88 | 1.00 | 1.13 | 1.25 |
| 0.32 | 0.40 | 0.48 | 0.56 | 0.64 | 0.72 | 0.80 |
| 0.20 | 0.25 | 0.30 | 0.35 | 0.40 | 0.45 | 0.50 |

The upper lever on the Norton's gear box also enables by its shifting to double the thickness of the peeled veneer. The machine is further equipped with a mechanism for instantaneous adjustment of the presser strip for two peeling thicknesses which can be pre-set by means of two handwheels. To change one thickness for the other, it is sufficient to move the hand lever to a new position.
The control of the machine is aided by an electromagnetic clutch for engaging and disengaging. The appropriate switch is situated on the operator's platform. D. C. power supply of 110 V and a capacity of 200 W is required for the clutch.



S 1300 Peeling Machine

**Technical data**

| | |
|---|---|
| Peeling knife length | 2,750 mm; 108″ |
| Maximum diameter of log | 1,300 mm; 51″ |
| Minimum peeling length without extension spindles | 2,250 mm; 88 1/2″ |
| Diameter of clamping spindles | 130 mm; 5″ |
| Minimum thickness of peeled veneer | 0.2 mm; 0.008″ |
| Maximum thickness of peeled veneer | 10 mm; 0.4″ |
| Clamping spindle revolutions | 15—45 per min. |
| Approximate capacity required for main drive | 45 HP, 500—1,500 r. p. m. |
| Approximate motor capacity for driving the left clamping spindle | 4.5 HP, 960 r. p. m. |
| Motor capacity required for increased feed of the beam | 3,8 HP, 960 r. p. m. |
| Weight of machine inclusive of all previously listed equipment | 15,300 kg; 33,756 lbs. |
| Net weight | kg |
| Weight in ordinary packing | kg |
| Weight in seaworthy packing | kg |
| Carriage space | $m^3$ |

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special mechanism
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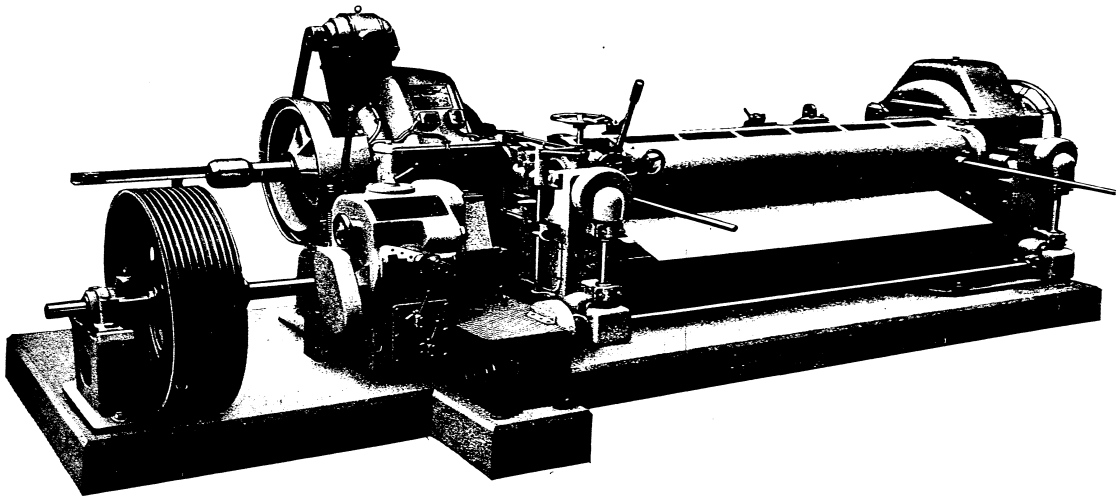
**S 1300** peeling machine



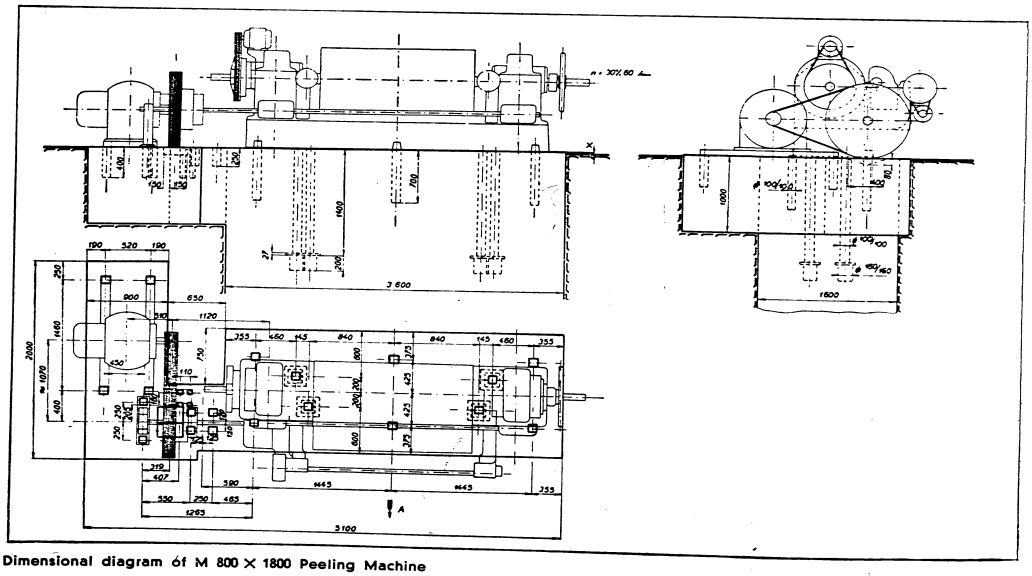
**Technical data and special characteristics of individual types:**

## S 1300 peeling machine

The particular advantage of this type is the combination seven-stage Norton gear box which provides a large selection of various thicknesses of veneers without having to change the gears, by simply positioning 4 levers. By replacing one gear a further range of thicknesses is obtained.

**Gear wheel with 28 teeth:**

| | | | | | | |
|---|---|---|---|---|---|---|
| 4.01 | 5.02 | 6.02 | 7.03 | 8.03 | 9.04 | 10.04 |
| 2.51 | 3.14 | 3.77 | 4.39 | 5.02 | 5.65 | 6.28 |
| 1.61 | 2.01 | 2.41 | 2.81 | 3.21 | 3.62 | 4.01 |
| 1.00 | 1.25 | 1.50 | 1.76 | 2.01 | 2.26 | 2.51 |
| 2.01 | 2.51 | 3.01 | 3.52 | 4.01 | 4.52 | 5.02 |
| 1.25 | 1.57 | 1.88 | 2.19 | 2.51 | 2.82 | 3.14 |
| 0.80 | 1.00 | 1.21 | 1.41 | 1.61 | 1.81 | 2.01 |
| 0.50 | 0.63 | 0.75 | 0.88 | 1.00 | 1.13 | 1.25 |



**Dimensional diagram of M 800 × 1800 Peeling Machine**

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The clamping spindles are made of the finest steel, are ground and seated in a special spindle sleeve which enables axial movement of the spindles during clamping. Each sleeve is fitted in two sturdy roller bearings. The axial pressure is transmitted into the stand by means of an axial bearing also fitted inside the stand.

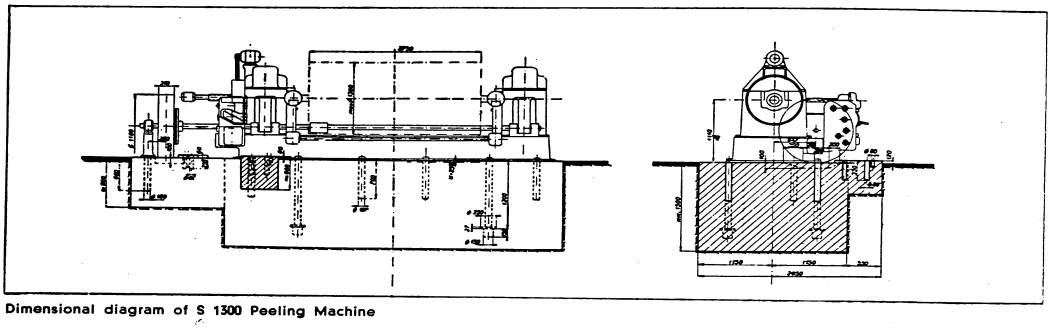
For quick clamping and releasing of the log every machine is equipped with a mechanical spindle clamping attachment. It is situated on the side of the main drive. The mechanical clamping attachment is driven by an electric motor and its operation is by push buttons. Besides this, both clamping spindles are provided with band brakes for manual clamping and releasing of the log.

On both stands are arranged sliding guide ways for the knife beam. This is also made of high quality material and is of a sturdy design to prevent any deflection and chatter of the knife. The knife is pressed against the beam by a special strip fitted to the knife beam by screws. Setting up of the peeling knife to a certain accurate height is facilitated by a number of setting screws underneath the beam. Facing the knife a presser strip of wear resisting steel is fitted on the presser beam. With the aid of this strip and by using the handwheels it is posible to set the space between the peeling knife and the strip according to the required thickness of veneers. The whole presser beam can be tilted aside for the purpose of occasional cleaning of the space between the knife and the strip.

The whole knife beam can, to a certain extent, be turned round the axis formed by the cutting edge of the knife by means of a handwheel. This enables the cutting angle to be changed.

All the peeling machines are also equipped with a special mechanism which makes possible automatic changing of the cutting angle in the course of peeling when the diameter of the peeled log is decreasing. The knife beam is fed into the cutting position by two precise spindles which are actuated from the main driving shaft through a Norton gear box. By changing the gear ratio of this box various thicknesses of peeled veneer are obtained.

On the knife beam are fitted trimming knives which serve for accurate cutting of both edges. For quick closing up of the knife beam with the peeled log (before commencing the peeling) or for withdrawing the beam (after finishing the peeling) the machine is equipped with an auxiliary electric motor operated by push buttons from the operator's stand. An additional knife may be used for splitting the veneer into two strips. The trimming knives are moving in grooves and they can be pushed out of action individually by turning a lever with an eccentric.



**Dimensional diagram of S 1300 Peeling Machine**

The whole machine is driven by a V-belt pulley with a clutch fitted on the main driving shaft and mounted in ball bearings. The clutch is directly operated from the operator's stand and permits instantaneous engaging or disengaging of the machine. For driving the peeler we recommend the use of a variable speed motor (500—1500 r. p. m.).

The machine's operation is controlled from a single operator's stand situated on the side of the main drive. To eliminate stoppages, all functions of the machine are so arranged that when end positions are reached the appropriate movement is automatically disengaged. Thus both end positions of the knife beam, whether at fast motor feed or at peeling, are safeguarded. In the same way the motor driving the clamping spindle is automatically stopped when clamping the log or when the end position is reached while the spindle is pushed out.

**The machine's equipment includes:**

1 electric motor for driving the clamping spindle, inclusive of push buttons and electrical wiring of the machine,
1 electric motor for feeding the knife beam, inclusive of push buttons and electrical installation on the machine,
1 peeling knife fitted in the machine,
1 presser strip,
3 trimming knives,
3 pairs of clamping jaws for various diameters,
1 extension spindle,
1 support bearing,
1 set of spare gears,
1 V-pulley for machine,
1 V-pulley for main electric motor,
1 set of V-belts,
1 set of foundation bolts,
1 set of spanners,
1 grease gun.

The principal driving motor can be supplied against extra order and charge.

**M 1300 p**

The principal fea
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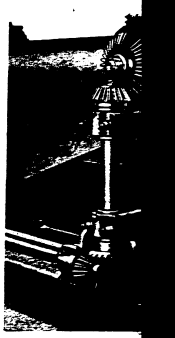
are obtained.



Detail of gears of

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# veneer

# peeling machines

Veneer peeling machines are designed for manufacturing smooth high quality veneers free from cracks and rifts. All kinds of wood which can be peeled and which have been appropriately prepared by scalding etc. can be worked on these machines.

Our standard programme of peelers covers the following sizes:

| type | S 1300 | M 1300 | M 800 |
|---|---|---|---|
| for logs up to max. diameter | 1300 mm; 51 in. | 1300 mm; 51 in. | 800 mm; 31 in., |
| for logs up to max. length | 2750 mm; 108 in. | 2400 mm; 94 in. | 1800 mm; 71 in., 1500 mm; 59 in. |

The thickness of veneers which can be peeled on the machines ranges from 0.2 mm to 6 mm or 10 mm resp.

All the machines are of a robust design which guarantees faultless and precise operation free from shocks even at maximum load. The high quality material used in the production of these machines together with precise machining of all parts ensure minimum wear and this in turn renders first class veneers. Easy access to all parts of the machine facilitates oiling and cleaning.

All types of peeling machines feature a solid bed on which are mounted two stands carrying the clamping spindles. The stands are cast of good quality iron and contain reduction gearings which drive the main clamping spindles. The gear wheels are of cast steel and their helical teeth are accurately machined. Automatic lubrication of gears in an oil bath at the bottom of the stand is provided.

**INVESTA**

**Ltd., Heavy Engineering Products, Import and Export Company**
**Branch Office: Bratislava, Gorkého 8, Czechoslovakia**

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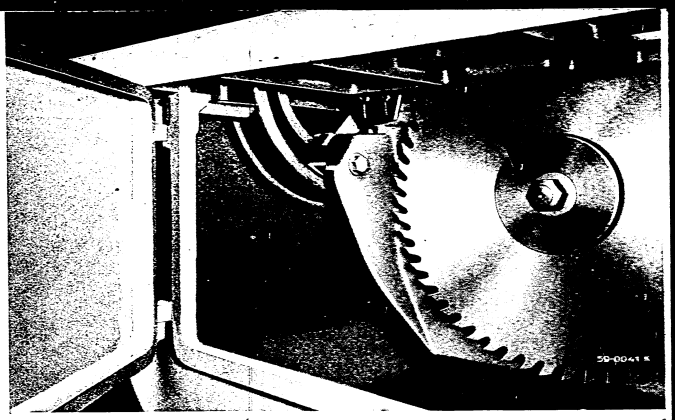
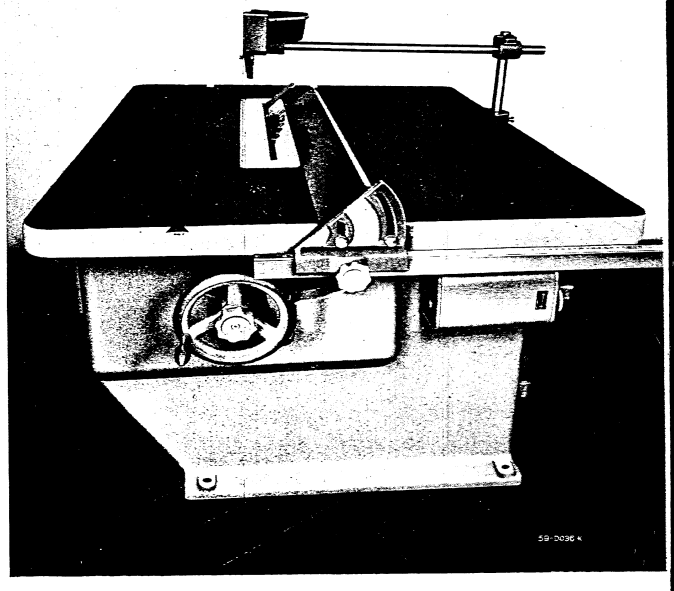
fixé sur la table d'une manière permettant d'utiliser pour le travail toute la largeur de la table. Le dispositif est en métal léger et recouvre la lame entière à l'arrêt de la machine. Pendant le travail on ne l'ouvre que suivant la hauteur de coupe demandée; sa pression sur la pièce usinée peut être réglée à l'aide d'un contrepoids. On l'emploie avec avantage même quand la lame de scie est en position oblique. Ce dispositif protecteur est basculant et permet un accès facile à la lame dont la partie inférieure est cachée dans le bâti de la machine.

**Coin fendeur.** Le coin fendeur est prévu sur l'un des angles du chariot du moteur et avance verticalement ou obliquement avec la lame de scie. En plus il est réglable de sorte qu'on peut l'employer pour des lames de différents diamètres.

**Support du moteur.** Le moteur de commande de la scie est monté sur un support robuste, réglable en hauteur et obliquement, et disposé dans l'intérieur du bâti. Son déplacement s'effectue facilement au moyen de roues à main d'un grand diamètre, en dehors de la machine. Le support réglé en hauteur peut être fixé par une roue à main dans toute position désirée. Au réglage oblique l'inclinaison peut être contrôlée sur une échelle graduée et le support peut être fixé par une vis à clef.

**Commande.** La commande se fait sans courroie par un moteur asynchrone triphasé spécial, plat, à cage d'écureuil, d'une puissance de 6 CV à 2880 tours/min. Le moteur d'une construction fermée, à refroidissement superficiel, est muni de paliers à billes robustes. L'usine se réserve le droit de modifier la construction de la machine. Les illustrations et les données techniques sont sans engagement de notre part.




**Accessoires normaux:**
2 clefs (17 et 41 mm),
1 lame de scie ⌀ 500 mm,
1 levier,
1 pompe à graisser,
1 capote protectrice de la lame,
1 règle longitudinale de guidage, réglable obliquement,
1 règle oblique,
1 livret d'instruction avec plan de graissage, installation électrique complète.

**Accessoires spéciaux:**
Interrupteur de protection à bouton.

**KOVO** SOCIÉTÉ ANONYME POUR LE COMMERCE DES MATIÈRES PREMIÈRES, ET PRODUITS MÉTALLURGIQUES ET DES CONSTRUCTIONS MÉCANIQUES, SUCCURSALE A **BRATISLAVA, MALINOVSKÉHO 24/c, TCHECOSLOVAQUIE**

Státní tiskárna ve Varnsdorfu - Imprimé en Tchécoslovaquie

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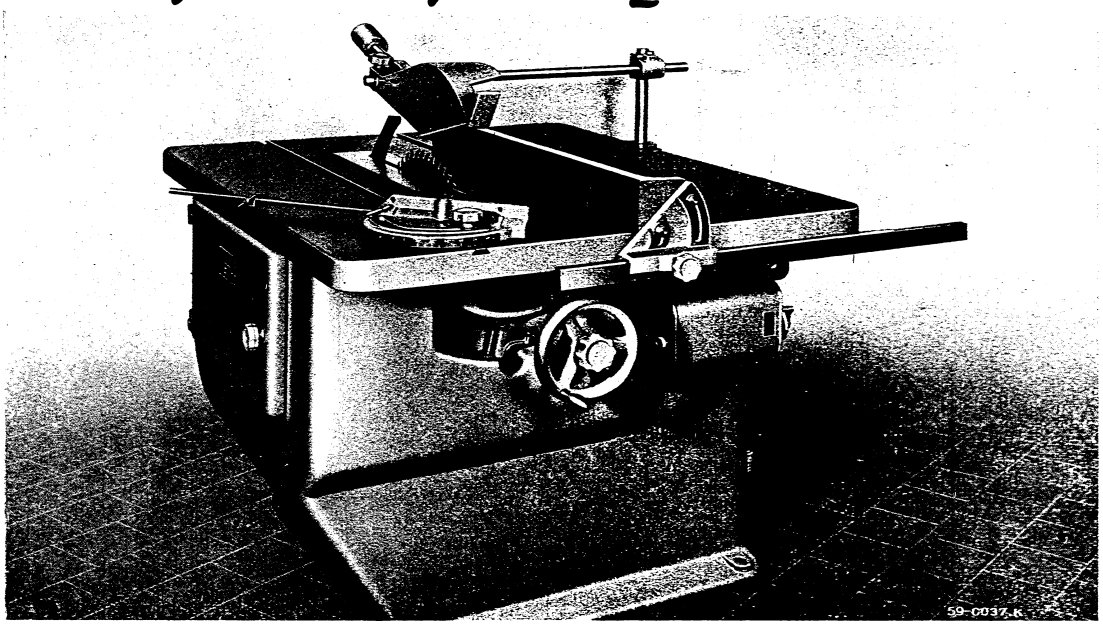
# ...laire universelle, pour coupe oblique TYPE RTM




| Dimensions de la table | | | Diamètre maximum de la lame de scie | Hauteur max. de coupe | Réglage maximum en hauteur | Réglage maximum oblique | Largeur de la table à gauche de la lame | Largeur de la table à droite de la lame | Puissance du moteur | Tours min. | Poids | | | Cubage |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| largeur mm | longueur mm | hauteur mm | mm | mm | mm | mm | mm | mm | kW | | net kg | brut kg | avec emballage maritime kg | m³ |
| 1000 | 1200 | 850 | 500 | 140 | 120 | 45° | 400 | 600 | 4,5 | 3000 | 794 | 870 | 940 | 1,44 |

guidage prismatique de la règle pour la coupe longitudinale, avec échelle encastrée, à graduation en millimètres.

**Règles.** L'équipement normal de la machine comprend une règle de guidage pour la coupe longitudinale, disposée verticalement sur la table. Cette règle avance facilement dans un guidage prismatique et peut être fixée par une vis dans la position désirée. La largeur de coupe peut dans chaque cas être exactement lue sur un indicateur. Tout déplacement de la règle longitudinale pendant le travail est rendu impossible. Sur demande et contre supplément nous fournissons une règle pour coupe longitudinale qui peut être réglée obliquement avec facilité et précision suivant une échelle graduée en degrées entre 0 et 45°. En plus nous équipons la machine d'une règle pour la coupe oblique pouvant être guidée dans les rainures de guidage soit à droite ou à gauche de la lame de la scie. Cette règle a une échelle bilatérale graduée de 0 à 45° et une rallonge munie d'une butée réglable pour couper en série des pièces d'une même longueur.

**Dispositifs de protection.** Le dispositif supérieur de protection de la lame de la scie est disposé sur un support spécial

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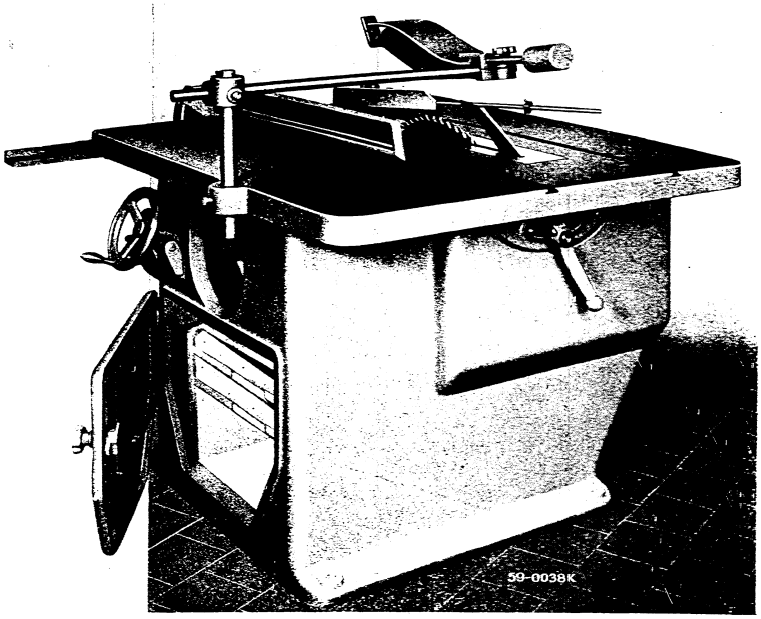
# Scie circulaire univers

**Emploi.** Cette scie convient pour toutes les opérations dans l'industrie du bois, qu'il s'agisse de coupes longitudinales, transversales ou obliques. La position de la table étant toujours horizontale on peut l'employer avec avantage pour des coupes de précision. Pour exécuter des coupes obliques le moteur de commande de la scie peut être incliné de jusqu'à 45°.




**Le bâti** de la machine, en forme de caisse et largement dimensionné, est coulé en une seule pièce; grâce à sa grande surface d'assise, il garantit une stabilité parfaite de la machine. Il comporte un mécanisme de levage et de basculement de la lame circulaire de scie, les éléments d'enclanchement, de déclanchement, de protection et les câbles d'amenée au moteur électrique. Les sciures tombent directement sous la lame dans une trémie formée par le bâti et peuvent être évacuées dans un canal au-dessous de la machine ou bien cette dernière peut être branchée sur un aspirateur des sciures. Le poste de l'ouvrier est toujours propre ce qui contribue considérablement à la sécurité au travail. Dans la partie arrière du bâti on a prévu quelques casiers pour les lames de réserve. La lame de scie est facilement accessible par une ouverture dans le bâti, fermée par un couvercle rotatif à verrouillage.

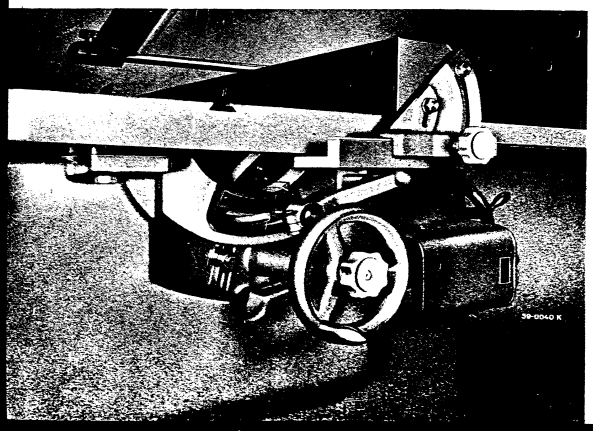



**Table.** La table est largement dimensionnée, bien renforcée et équipée d'une plaque amovible pour la lame de la scie. A droite et à gauche de la lame se trouvent des rainures de guidage de la règle pour la coupe oblique. Dans la partie avant de la table il y a un

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| 1000 |

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# Scie circulaire universelle pour coupe oblique

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**M O T O K O V** - Foreign Trade Corporation
Praha, Czechoslovakia.

## COMBINED HAND PLANER AND SINGLE SURFACER U K H 63.

The machine frame is thoroughly ribbed and made as one-piece cored casting, thus ensuring vibrationless smooth running. The base of the frame containing both the driving motor and the feed box is totally enclosed to prevent penetration of dust.

The drive is through V-belts from the built-in motor.

The feed changing box which is located inside the frame is driven by means of a flat from the main motor. Starting and stopping the feed motion is done by loosening the tension pulley of the flat belt. Two rates of feed are available through the application of treadle so that the operators hands remain free. The gear box is totally enclosed and the gears run in an oil bath. The high speed shafts are ball bearing equipped. The power transmission over to the feed rolls is effected by means of a strong chain, the stretching of which is achieved through a tension pulley.

The surfacing bed has rolls running on ball bearings. These sliding rolls are vertically adjustable according to the scale by applying a hand wheel placed directly on the right hand side of the bed. The position of the bed can be secured by means of a lever arranged under the bed.

Cutterhead: the feed rolls as well as the pressure bars are swivel suspended on the machine frame. The wood occasionally flying back is retained by the safety kick-back device. On loosening three bolts the pressure bars can be shifted away from the cutterhead by maximally 15 mm, thus enabling moulding jobs to be carried out up to the mentioned depth.

The smoothing tables rest on four setting steel blocks and on loosening of two screws they can be drawn out and turned aside in order not to interfere with surfacing for thickness. The front table can be vertically adjusted by a lever and secured in position, while the rear table is set according to the cutting knife circle by means of a screw and a hand wheel.

The guide fence is quickly adjustable on a rod and can be tilted maximally by 45 deg. It is fixed on the frame and remains in its position when the table is tilted. Both the flat hold-down and/or the hodl-over springs provided on the fence and the table serve for safe operation when moulding or jointning.

Technical data:

| | |
|---|---|
| length of table | 2000 mm (abt. 79") |
| width of table | 630 mm (abt. 25") |
| height above floor | 800 mm (abt. 30 1/2") |
| thickness of shaving | 8 mm ( 5/16") |
| fence | 1000x150 mm (40"x6") |
| surfacing bed: length | 1100 mm (43 3/4") |
| width | 630 mm (25") |
| cutterhead | 120 mm dia (4 3/4") |
| speed of cutterhead | 4200 R.P.M. |
| planing height | 200 mm (abt 8") |
| rates of feed | 6 and 10 m/min |
| motor size | 4 kW/5, 5HP/2800 R.P.M |

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# POWER BLADE GRINDING MACHINE FOR THE SHARPENING OF BLADES OF 2400 MM UP TO 4200 MM IN LENGTH TYPE B N.

The machine has been designed for the grinding of blades employed on peeling and cutting machines and for veneer shearing machines.

The powerfully dimensioned bed is made of cast iron and provided on its upper surface with two slides along which the wheel head moves. The wheel slide carries the headstock together with the grinding spindle as well as the 2,2 kW, 1450 R.P.M. motor driving the grinding wheel. The longitudinal movement of the slide is effected by means of a rope and a pulley. The pulley is driven by a 1 kW /app/, 960 R.P.M. motor via a worm gearing. The return movement of the slide is carried out by reversing the run of the motor. This is effected through two limit switches. Adjustable stops enable the length of the slide movement to be set to suit individual requirements.

The blade to be ground is clamped with the aid of clamps on to the brace, which is operated by means of a worm gearing, enables any wedge angle to be set. Parallelism between the ground blade and the wheel head guide- ways is established by means of adjustment screws provided on both sides of the brace. The in-feed movement is controlled by the central wheel which, in turning both of the screws, at the same time approaches the entire blade spindles towards the grinding wheel.

The machine is delivered equipped with a complete electrical outfit comprising:

1 motor for grinding /power 2,2 kW, speed, 1450 R.P.M./,
1 motor for feeding /power 1 kW, speed, 960 R.P.M./
2 switches complete with fuses,
2 reversing limit switches,
complete fittings with a rubber cable,
spanners, foundation screws and a pressure lubricator
are supplied for use with the machine.

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MOTOKOV - PRAHA
CZECHOSLOVAKIA

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sufficiently fine with the help of a screw and a hand crank. The carriagr is moved by means of a crank a screw with a large pitch. A taper catch locks the cutter shaft perfectly when grinding. When the cutters have been sharpened, the two screws ar loosened and the motor is taken off the machine to prevent it from hindering operation.
The knife setting gauge made of light alloy serves for the exact adjustment of all four knives to the same cutting diameter. The distance between the knife cutting edge and the edge of the chip breaker can be set with the help of two screws according to the scale in the range from 0 - 3 mm /0 - 1/8"/. When this adjusted distance is very short, the knives plane absolutely without tearing the material but the electromotor is fully loaded. When executing rough planing, planing broad stock or thick chips and at high feeding speeds, a greater distance /2 - 3 mm/ is recommanded in order not to overload the motor.

Uses

This machine is suitable for all jointer's work where exact light and average planing is required.

Technical data:

| | |
|---|---|
| Width of planing | 630, 800, 1000 mm - 25, 32, 50 ins |
| Height of planing | 2 - 200 mm - 5/64 - 8 inches. |
| Maximum chip | 10 mm - 3/9 inches |
| Feeding speed | 6, 10, 14, 20 m/min - 20, 33, 46, 66 ft |
| Cuttershaft: diameter | 120 mm - 5 inches |
| revolutions per minute | 4200 |
| number of knives | 4 |
| Feeding rollers - diameter | 100 mm - 4 inches |
| length of table | 1150 mm - 45 inches |
| driving electric motor | 2800 RPM - 8, 9, 13 kW |
| grinding electric motor | 2800 RPM - 0,5 kW |

M O T O K O V

Praha - Czechoslovakia

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# THICKNESSSING MACHINE HPB 63, 80 ,100.

Technical description.

The heavy stand of case shape guarantees smooth running of the machine without shocks. The enlarged base surface of the stnad gives the machine perfect stability.

The working table quided in four scraped ways arranged on the side walls is well ribbed so that its upper machined surface maintains the accuracy. The two table rollers seated in the ball bearings are vertically adjustable by means of a hand lever on the table. The height of the rollers above the table is indicated on a scale.

The adjustment of the table is effected either by moter or by hand. When the lever is lowered the table sinks quickly and when it is lifted the table rises at half the speed. When pressure on the lever is released it returns automatically to the zero position. The transmission is of friction type so that no damage can occur either when the table is in its extrem positions or when the position of the lever is quickly changed. Adjustment by hand is effected only for accurate setting. The table rests on three perfectly covered hoisting screws which are therefore dustproof. The weight of the table is carried by an axial ball bearing which facilitates lifting.

The safety cutter shaft runs in ball bearing and is provided with four keyways for clamping the strip knives which are tightened up by the centrifugal force. The shaft is perfectly equilibrated and thus it ensures smooth running of the machine without shocks. Both the frontand the rear parts of the hold-down mechanism are of sectional type so that the pressure is uniformly distributed on the whole surface of the thicknessed stock. The front pressure can be swung round the cutter shaft and easily repaired of cleaned.

The feeding mechanism consists of two feeding rollers near the cutter shaft. The front roller has slanting grooves, the rear roller is smooth. The pressure of feeding rollers can be changed, even when the machine is running, by means of hand wheels on the machine stand, so that thin and narrow boards do not bend or crack. The feeding rollers are driven by steel gears from the transmission box. Changing of the feeding speeds is locked so that the gears in the box cannot be changed over when the slutch is engaged. The oil bath of the transmission box in which the gears run ensures long life and a quiet and reliable run. The lubrication and running of the gear box is controlled through a large glass sight hole on the back side of the cover. The transmission box is driven from the cutter shaft by three V-belts tightened by a spring loaded tension pulley. The whole transmission on gear is provided with ball bearings.

Anti-kick back pawls ensure safety of labour by selflocking cast pawls which catch the stock should it be thrown back.

The drive of the cutter shaft is effected by Vee-belts from an electromotor arranged in the stand. The switches are installed in the left side wall and the fuses in the stand, all being dustproof. The Vee-belts are tightened by means of two screws on the stand. The grinding attachment mounted on the machine ensures an exact cylindrical form of the cutting circle of all four knives of the shaft. The rubust way of the grinding moter slide is fixed above on the side walls. The adjustment of the grinding carriage is made

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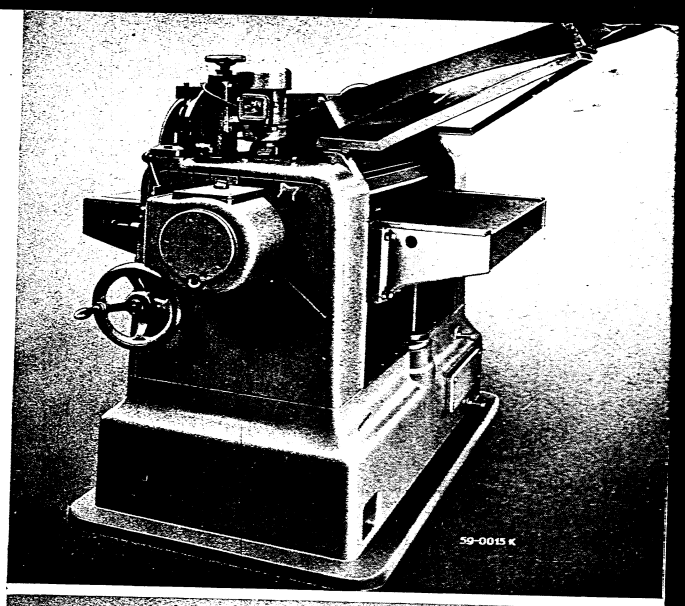


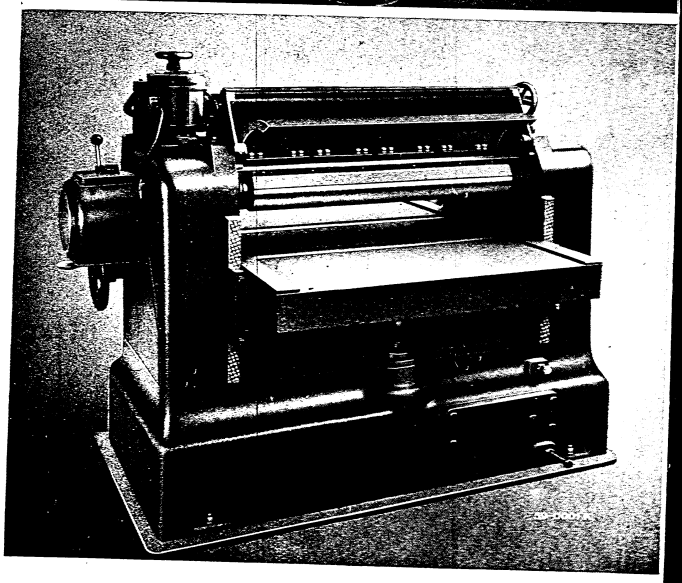

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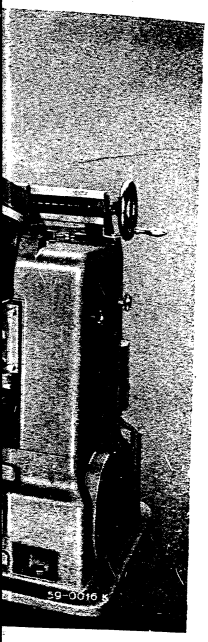

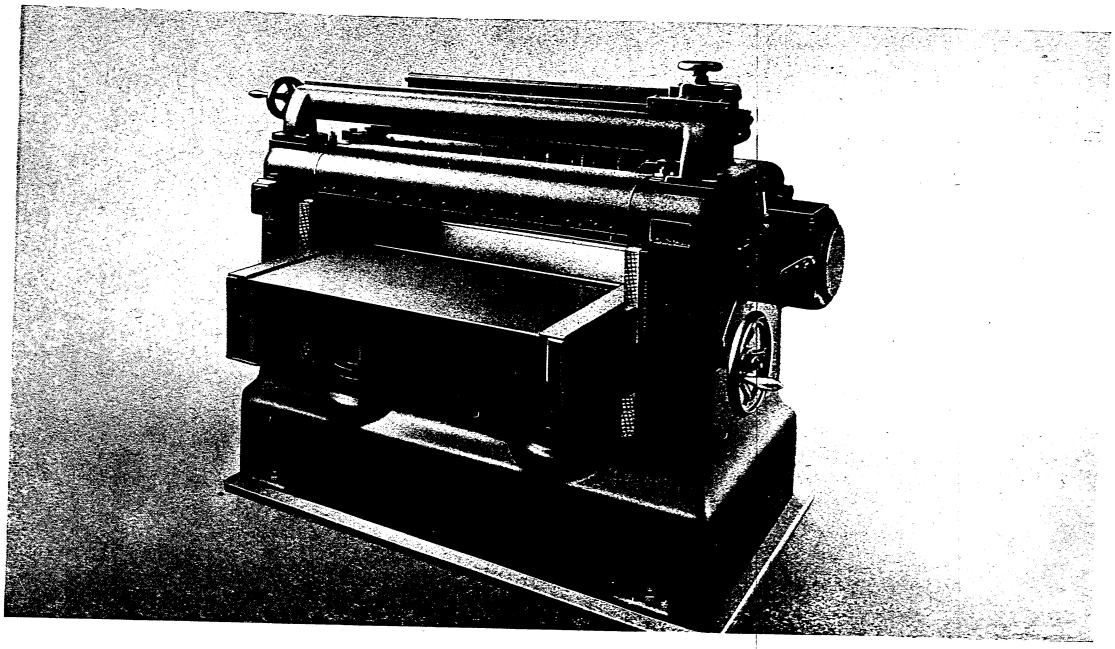

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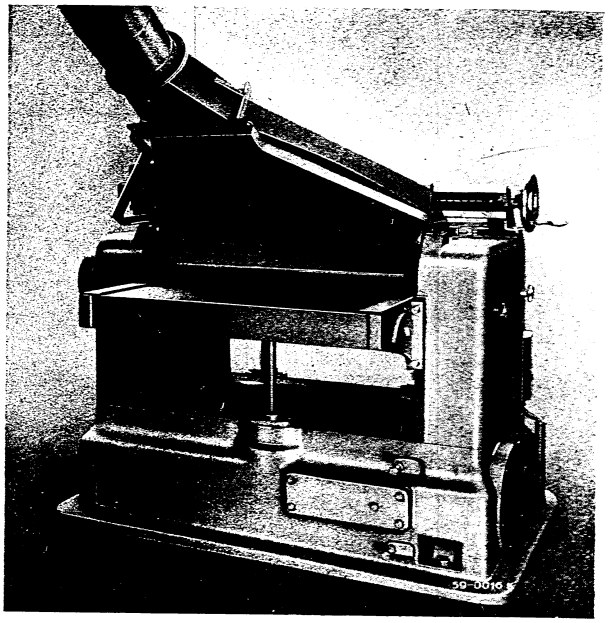

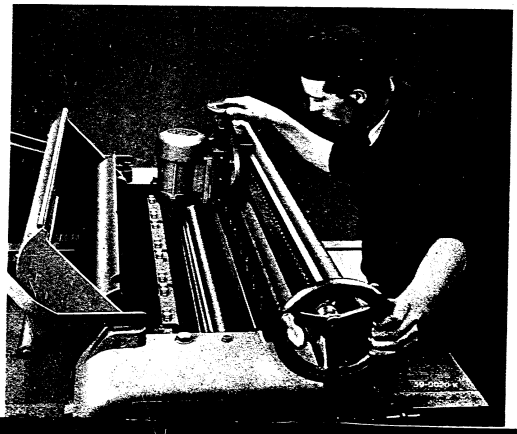

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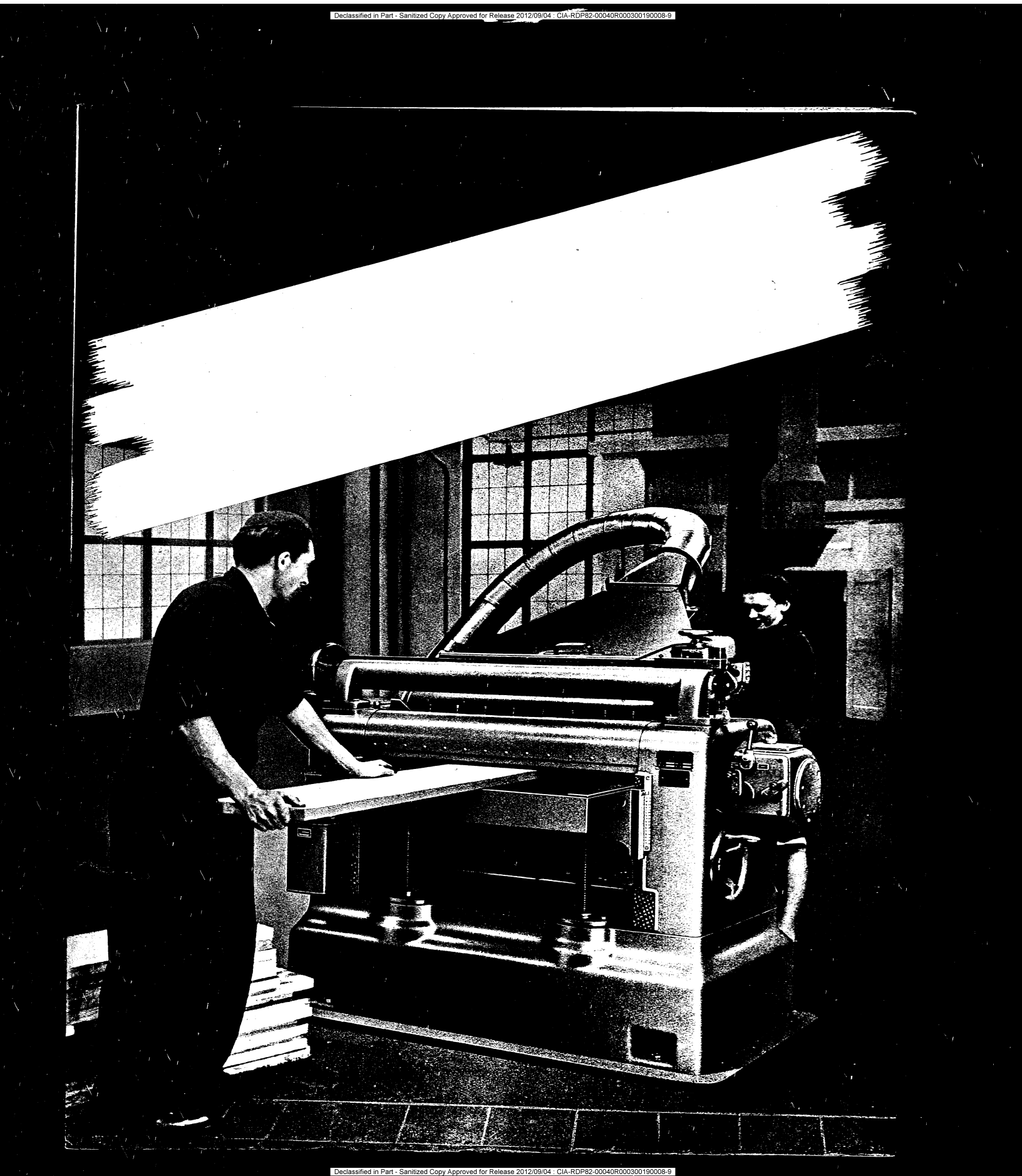

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## Hand supports.

For manual turning three different hand supports are delivered. They are clamped in a holder which is fastened to the bed. When turning on the back side, these supports are fastened in the revolving head of the cast iron stand.

## Technical data.

| | | |
|---|---|---|
| Height of centre above the bed | 300 mm | 12" |
| max.distance of centres | 2000 mm | 80" |
| turning diameter above the bed | 580 mm | 23" |
| turning diameter above the cariage | 480 mm | 19" |
| diameter of front face plate | 250 mm | 10" |
| diameter of back face plate | 400 mm | 32" |
| width of bed | 280 mm | 11" |
| diameter of spindle in the bearings | 50 mm | 2" |
| number of speeds | 4 | |
| range of revolutions | 340 - 2800 RPM | |
| electromotor 220/380 V, 50 cyc/s. | 1,1 kW | 1,5 HP |
| Netweight incl.accessories | 710 kg | 1560 lbs |
| Grossweight with railway packing | 750 kg | 1650 lbs |
| Grossweight with seaworthy packing | 850 kg | 1870 lbs |

## Normal accessories.

2 carrying face plates - a big and a smaller one
1 carrying centre
1 centre of the tail stock
3 hand supports - a long , a short and an angular one
1 tripod
1 support head
1 carrier of hand support
1 tool holder with spacers
1 clamping device for support carrier
1 tool clamping device
1 hand grease gun
3 double-ended spanners - 14/17, 17/19 and 24/30 mm
1 socket wrench for square 14 mm

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# WOOD PATTERN TURNING LATHE Type S H S .

## Description:

The pattern turning lathe SHS is constructed for universal use when producing patterns. Besides normal manual turning also an exact turning is possible what is enabled by a cross slide rest and a clamping device for tool holders moved by a hand crank and a screw. For turning big patterns there is a face plate /of a diameter of 400 mm - 16 inches/ screwed on the outer end of the spindle and a stand of cast iron with an adjustable revolving head for the hand support, both delivered among the normal accessories. This stand is put near the turned pattern. The well dimensioned head stock, a heavy frame and bed, suitable revolutions and an accurate execution, all these components enable exact turning even of big pieces.

## Headstock.

The spindle is mounted in two big ball bearings chucked in dustproof sleeves. The spindle with the sleeves is seated in a way that it may be easily and quickly removed from the stockhead /necessary when changing the belt/. Both ends of the spindle have threads for the face plate. The spindle possesses an inner Morse cone No.2. On the face side, in the middle of the headstock, a lever is placed, moving it up we start the machine, moving it down we stop it braking at the same time. This lever is connected with the electromotor switch, so that the motor never runs idle.

## Drive:

The spindle is driven by an electromotor over transmission of V-belts. The motor is suspended on the arm of the countershaft. The number of revolutions of the spindle may be changed by removing the V-belt on the stepped pulleys. With help of a lever placed on the left side of the headstock, the arm is slightly inclined to the headstock and then the V-belt may be easily removed. Also the guard of the V-belts may be removed quickly, so that changing the number of revolutions is a simple affair.

## Bed:

The bed has a broad flat guide exactly machined and scraped which reliably bears the support and the tail stock. The bed is well ribbed in order not to deflect and so it assures an accurate turning even of heavy pieces. It is placed on the side of the head stock in a casing which contains the cut-outs.

## Carriage:

It is of cross slide rest type and bears a clamping device and a tool holder for disc tools. Its upper part is revolving around its vertical axis. The desired angle is set according a scale. The carriage is moved easily on the bed with help of a hand wheel and a transmission gearing which engages in a rack. The carriage may be tightly clamped to the bed in any position with help of a small lever on the lower part of the carriage.

## Tail stock.

It has a morse cone No.2 and may be moved by a hand wheel and locked by a hadn lever.

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**THE FEED MECHANISM** is driven off the saw shaft by a flat belt so that, when the saw shaft speed decreases, the feed rate decreases in proportion. The feed is controlled by a hand lever arranged on the operating side of the machine.
The machine has three feed rates which are changed by sliding gears in the gear box. The operating lever is arranged at the front of the column. The gears in the gear box run in an oil bath.

**THE TABLE** is adjustable for height. Its position is adaptable to the diameter of the saw blades fitted. At the point below the saw blades the table is provided with an interchangeable wooden insert through which the saw blades pass with their edges. For cutting operations with a single saw blade the machine is equipped with a long guiding fence adjustable sideways.

**THE DRIVE.** The driving motor is enclosed in the column and well protected against dust. It is attached to a hinged plate. The power is transmitted to the saw shaft by V-belts. The motor is started by a switch fitted flush with the surface of the column.

## STANDARD EQUIPMENT:

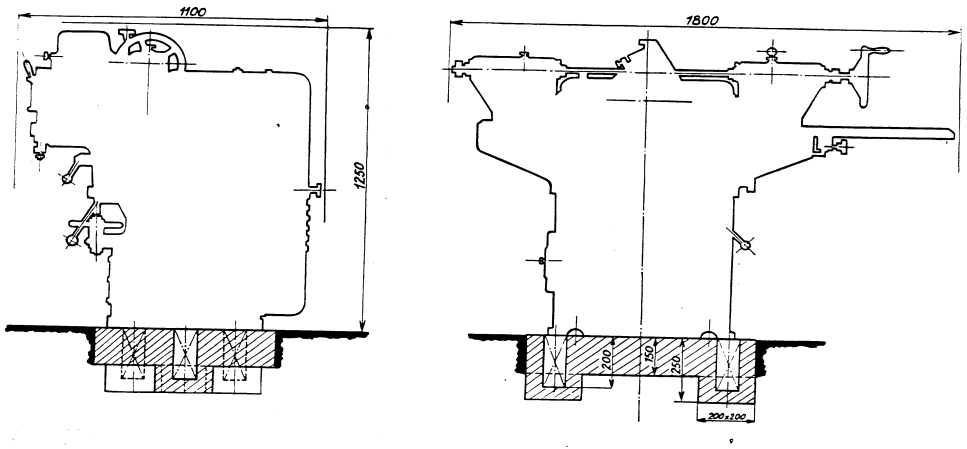
7 circular saw blades dia. 250 mm (10″) with a 40 mm (1 $^{37}/_{64}$″) hole, 6 saw blade spacer rings for cutting 20 mm ($^{25}/_{32}$″) wide laths, 1 electric motor with star-delta starter, fuses and complete wiring, 1 set of spanners.
Spacer rings of other width can only be supplied on special order at an extra charge.

SPECIFICATION:

| | | | |
|---|---|---|---|
| Saw blades: maximum diameter | mm | 250 | 10″ |
| minimum diameter | mm | 180 | $7^{1}/_{16}$″ |
| diameter of hole | mm | 40 | $^{37}/_{64}$″ |
| Maximum height of cut with 250 mm (10″) diameter saw blade | mm | 70 | $2^{3}/_{4}$″ |
| Maximum distance between end saw blades | mm | 150 | 6″ |
| Shortest pieces cut | mm | 480 | 19″ |
| Speed of saw shaft | R. p. M. | 4250 | |
| Electric motor: output | kW | 15 | |
| speed | R. p. M. | 2900 | |
| Feed rates | metres per min. | 9—13—20 | |
| | feet per min. | | 29½—43—65½ |
| Weight of machine with equipment | kg | 940 | 2080 lbs |
| Shipping weight, ordinary packing | kg | 995 | 2200 lbs |
| Shipping weight, seaworthy packing | kg | 1190 | 2620 lbs |
| Contents boxed | m³ | 4,8 | 160 cu. ft. |

IN ORDERING, SPECIFY VOLTAGE, PHASE AND FREQUENCY OF POWER SUPPLY!

As improvements in design are continually being made, this specification is not to be regarded as binding in detail, and dimensions are subject to alteration without notice.




**INVESTA**

BRATISLAVA, CZECHOSLOVAKIA

Printed in Czechoslovakia

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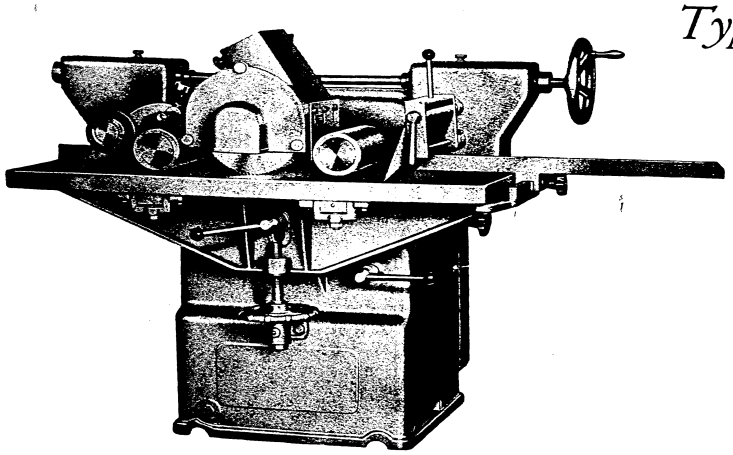
# MULTIPLE RIP-SAW

*Type*



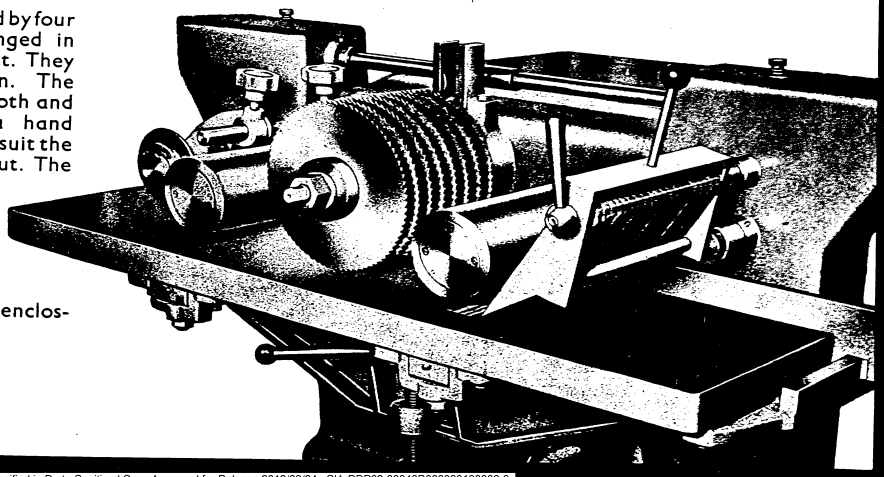
is intended for the cutting of a large number of laths of various sizes and is used to particular advantage in factories producing ornamental picture frame mouldings or cutting laths for cores of joiner's plywood, stiffening for light luggage, crates etc. Apart from cutting with several saw blades one can also operate the machine with a single saw blade. The machine then replaces a special circular saw with power feed.

## DESCRIPTION:

**THE SAW SHAFT** of large diameter reduces vibrations to a minimum even at the maximum output of the machine.

**THE SAW BLADES** are mounted overhung on the free end of the saw shaft. Circular saw blades with diameters from 180 to 250 mm ($7^{1}/_{16}$″ to 10″) can be used on the machine. Spacer rings are inserted between the individual saw blades to suit the width of the laths being cut. The distance between the two end blades can be as much as 150 mm (6″).
The blades are enclosed in a saw guard which is adjustable for height to suit the thickness of the timber being cut and the diameter of the blades. The saw guard also forms a dust hood and has a sleeve for, connection to the dust exhaust piping of the plant.
When working with a single saw blade a special knife wheel running in ball bearings is inserted into the cut. This wheel performs the duty of a parting wedge and is arranged on the output side of the machine. When the machine is operated with several saw blades the wheel is rendered inoperative by being lifted to its upper position.

**THE FEED** of timber is effected by four rollers. Two of them are arranged in the table and project above it. They are fluted and power driven. The upper pressure rollers are smooth and adjusted simultaneously by a hand wheel to the required height to suit the thickness of the timber being cut. The rollers are pressed against the timber by powerful springs acting upon a system of levers. The lower as well as upper rollers run in ball bearings. The springs and their levers are completely enclosed and protected by guards.



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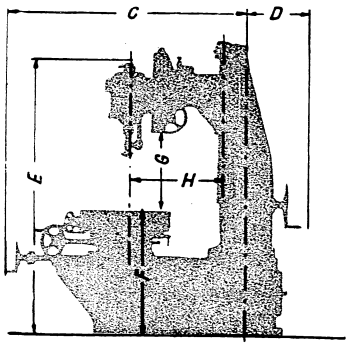
# ACCESSORIES AND TECHNICAL DATA

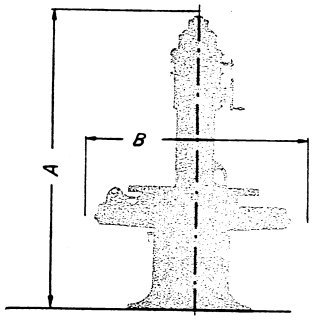
***STANDARD ACCESSORIES:***

1 - centering arbor for accurate setting of table
2 - cutter holders
2 - sample cutters for pattern and corebox
1 - pole-changing switch with fuses and complete electrical equipment fitted on machine
1 - set of standard and special spanners necessary for operation of machine.

***DIMENSIONS AND TECHNICAL DATA:***

| Type of machine | | FMR | |
|---|---|---|---|
| Throat | | 600 mm | 23.62" |
| Dimensions of table | width | 500 mm | 19.69" |
| | length | 850 mm | 33.46" |
| | height above floor | 910 mm | 35.82" |
| Table movements: | longitudinal | 1000 mm | 39.37" |
| | transverse | 600 mm | 23.62" |
| | rotary | 360° | |
| Maximum radius of machined pattern | | 875 mm | 34.44" |
| Top position of bottom edge of swivel head over table | | 675 mm | 26.57" |
| Electric motor: | output | 1,7/1,5 kW | |
| | speed | 3000/1500 r. p. m. | |
| Overall height of machine | | 2170 mm | 85.44" |
| Net weight of machine | | 1340 kg | 2954 lb |
| Weight of machine with one set of tools | | 1380 kg | 3042 lb |
| Gross shipping weight of machine: with railway packing (2 boxes) | | 1580 kg | 3483 lb |
| with seaworthy packing (2 boxes) | | 1780 kg | 3924 lb |
| Volume of seaworthy packing (1 box) | | 2,20 m³ | 78 cu. ft. |
| (1 box) | | 3,20 m³ | 113 cu. ft. |




| FMR | |
|---|---|
| A = 2170 mm | = 85.44" |
| B = max. 2220 mm | = 87.40" |
| C = 1550 mm | = 61.—" |
| D = 400 mm | = 15.75" |
| E = max. 2320 mm | = 91.34" |
| F = 910 mm | = 35.82" |
| G = max. 675 mm | = 26.57" |
| H = 605 mm | = 23.82" |

**MOTOKOV**

PRAHA • CZECHOSLOVAKIA

ČOK 540235 e - 5509

Printed in Czechoslovakia (ZMT 03 Vyškov - 1154 55)

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# L PATTERN AND COREBOX SHAPER

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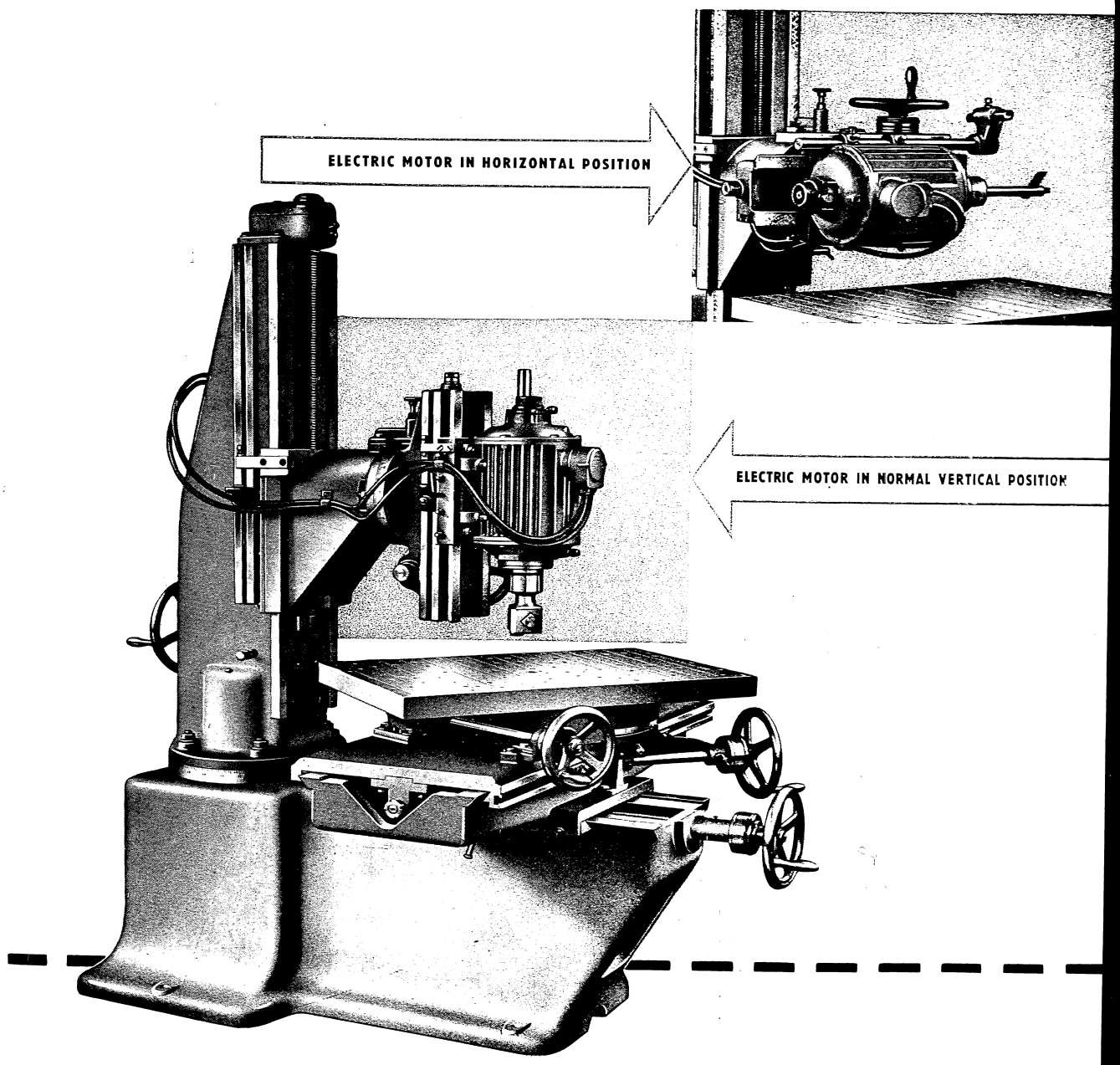


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FMR

# UNIVERSAL PATTERN

Wooden patterns for moulding various parts of cast iron, cast steel or non-ferrous metals have frequently very intricate shapes. Their manufacture is expensive because most of the operations must be performed by hand. Our FMR universal pattern and corebox shaper has been designed with the aim of reducing these costly manual operations to a minimum.

The construction of the machine is very sturdy in order to ensure the high accuracy required of patterns of machine parts. Vibrations produced during the operation are absorbed by the mass of the machine. The heavy frame of the machine carries a cross slide for the longitudinal and transverse motion of the table. The slide moves on prismatic guideways. The clamping table has a rotary motion. All three movements of the table are controlled by means of hand wheels, which are easily accessible from the operator's position. The rate of both the longitudinal and transverse motions can be read on scales graduated in millimetres and the fine setting on micrometer rings on the hand wheels. In this way the table can be adjusted with an accuracy of 0,1 mm 0, inch. The rotary motion of the table is obtained by a worm and worm wheel. An angular vernier enables any angle to be set with an accuracy of one minute. There is a graduated ring on the hand wheel for the rotary table motion that enables easy checking of the angular movement of the table by turning the hand wheel. The longitudinal as well as the transverse travel of the table can be limited by adjustable stops which can be pre-set on the millimetre scale according to the movement required. This simplifies the work considerably as it eliminates frequent measuring of the pattern dimensions. The table can be securely locked in any set up position by means of locking levers.

The sturdy column reinforced with ribs can be rotated 360° on the scale. The column is turned when patterns of large diameters are to be machined.

A bracket carrying the swivel head moves vertically on the prismatic ways of the column. The head can be swung at any angle on an angular scale with a vernier. Both the vertical and horizontal positions of the head are secured by a pawl. The shaper motor slides in the ways on the swivel head. This movement is controlled by a hand wheel and can be watched on a millimetre scale as well as on a micrometer ring on the hand wheel. When shaping or deep boring, the travel of the cutter spindle can be pre-set by means of a positive stop. The motor of the cutter spindle as well as the bracket can be secured in any position.

The cutter spindle is formed by the shaft of the special three squirrel cage induction motor. The motor is arranged for pole changing and has two speed rates of 3000 and 1500 r. p. m. The motor shaft is exceptionally rigid and the cutter arbors are fitted into it by means of a No. 4 Morse taper and a differential nut. The motor shaft runs in precision ball bearings of ample size. They are grease lubricated, enabling the motor to run at any angular adjustment. Long arbors which are likely to vibrate during the operation are held by a steady rest. The latter takes up the working pressure near the tool and can be swung out of the way as shown in one of the illustrations (Motor in horizontal position).

The pattern and corebox shaper is suitable for straight line or rectangular shaping, or shaping at any angle, horizontally or vertically. A circle can be divided without being traced, straight or circular slots can be cut, etc. Examples of such work are shown in the table.

A wide variety of operations can be performed on the machine. Therefore it should be equipped with a set of various special arbors, holders, heads, bushes, cutters, etc. We can supply the complete set or individual tools on special order at an extra charge. Numbers and names of the warious cutters or parts should be quoted in the order as per the table.

The standard electric motor supplied with the universal pattern shaper is a three-phase motor for 380 Volts, 50 cycles. On request a motor can be supplied for another voltage or a different frequency. The voltage between the phases of the mains must be clearly stated in the order (e. g. 3×500 Volts, 50 cycles, etc.).

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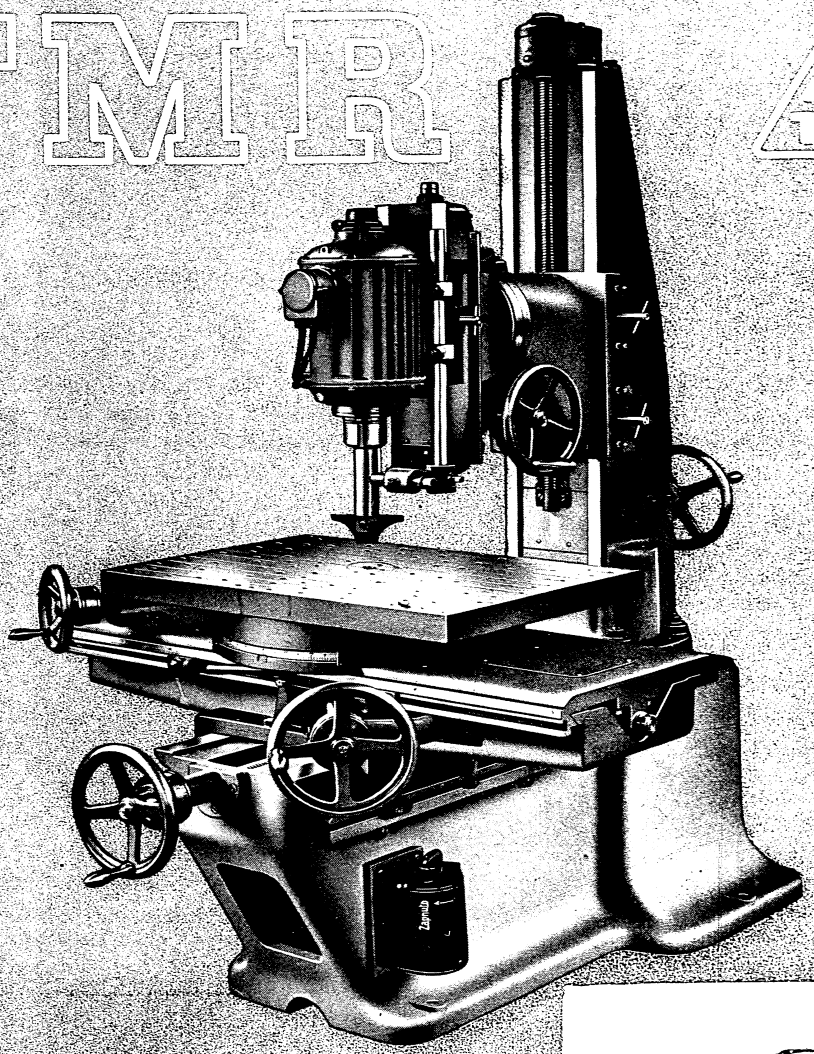

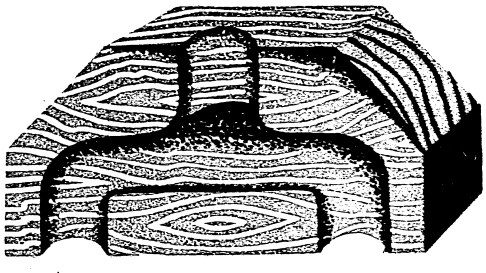

## UNIVERSAL PATTERN AND COREBOX SHAPER

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## APPLICATION

This machine serves for sanding-off the unevennesses of the flat surfaces, i. e. on parts of building work, furniture, etc.
The sanded surfaces are perfectly smooth.
Surfaces which are to be veneered may be roughened by coarse-grained sand-paper.
Panels covered with a thin precious veneer can be sanded in this machine before polishing.
As far as the output is concerned this machine easily replaces the work of five or six skilled men.

**The frame of the machine** consists of two side frames connected together by long cross girts. The left side frame carries the three-phase asynchronous motor of special construction on the extended shaft of which the driven sanding belt wheel rests. In the prismatic guide on the other side frame there is the loose wheel with its tilting and tensioning attachment and adjustment in the longitudinal direction. The sanding belt is guided over the both wheels and tensioned by a coil spring.
The hand stroke hold-down shoe can be easily moved on a rod along the whole length of the sanding belt, whereby it is hold against the belt by slightly pressing the hand lever.

**The travelling table** of light but strong construction is easily displaced by hand on two prismatic guiding bars as it rests on eight hardened and ground pulleys. The table is adjusted to the height by means of a hand wheel and a worm gear. It is supplied with an adjustable guide fence against which the sanded panels lean with their edge.

**The driven wheel** is fitted with a removable disc, at the front, which may be covered with sand paper for sanding small work. For this purpose there is a vertically adjustable little table arranged in front of this wheell.

**The motor** is three-phase, asynchronous, with a special double-slotted squirrel cage. Usually we supply the motor for a working voltage of 380 V, 50 cycles. If required we supply a motor for another working voltage, which should, however, be mentioned in the order.

**The bearings** of the motor as well as those of the loose wheel are of precision ball type.
Should the workshop in which the machine is to be installed be without central dust collecting system, we supply the machine on special request and with corresponding adjustment of price with a small suction fan of its own, which is fixed to the left side frame and connected with the suction branch by means of a flexible metal tube.

## ACCESSORIES

1 sanding belt
1 star-delta switch with fuses and complete electrical outfit mounted on the machine
1 suction fan with a dust hood and a flexible connecting tube (at extra cost)
1 set of necessary spanners

## DIMENSIONS AND TECHNICAL DATA

| | |
|---|---|
| Diameter of wheels ..... mm | 300 |
| Max. width of sanding belt ..... mm | 150 |
| Size of travelling table ..... mm | 800×2250 |
| Max. working width ..... mm | 2200 |
| Cross movement of table ..... mm | 800 |
| Lowest position of table (distance from sanding belt) ..... mm | 425 |
| Size of motor ..... HP | 4 |
| Speed of motor ..... R. P. M. | 960 |

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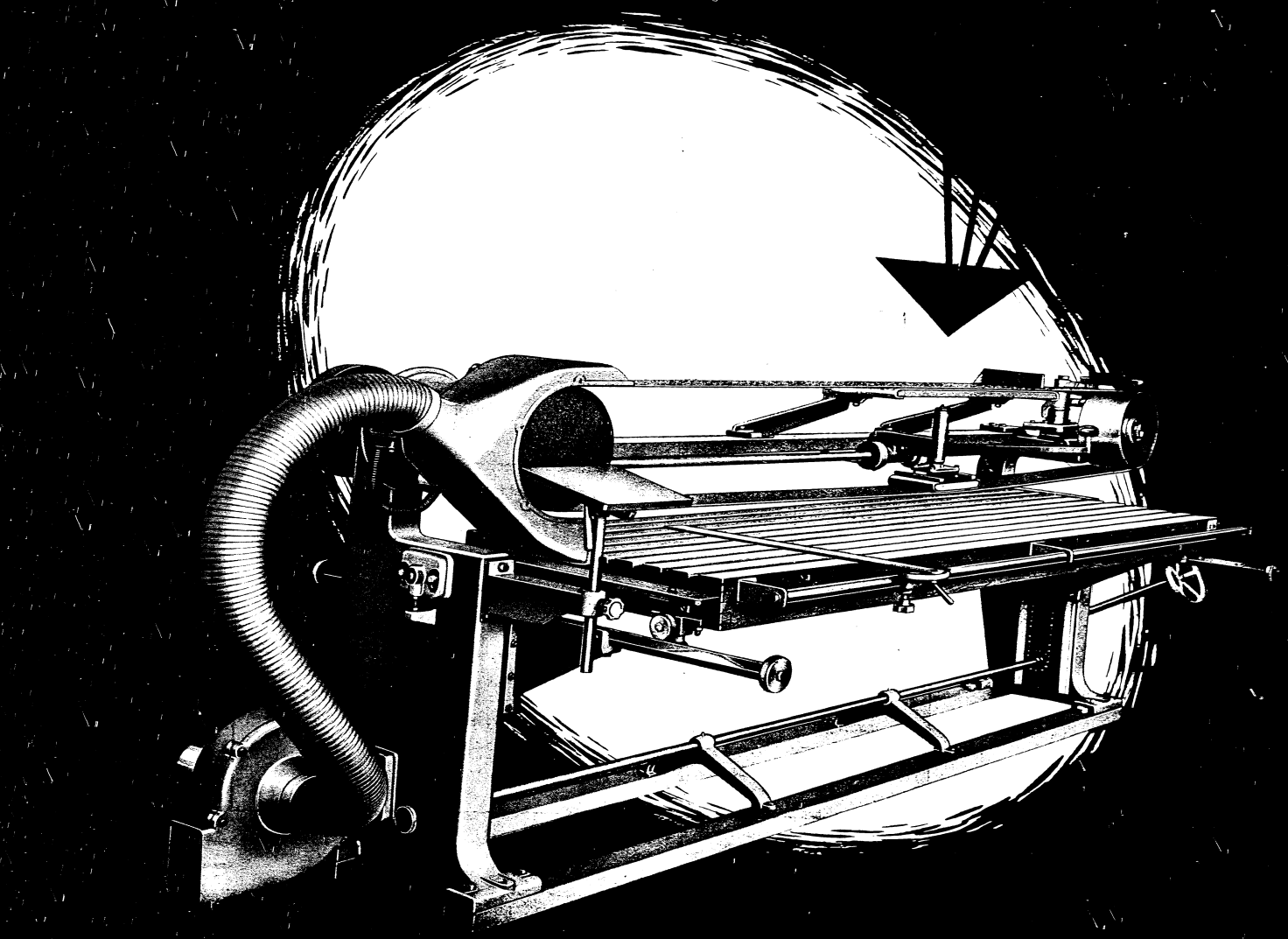
# BPT



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## Glue applying machine type LAMF.

Drive by electromotor and belt.

The veneers are automatically passed between two cast iron rolls having longitudinal grooves for applying glue.

The upper spring loaded roll may be according to the thickness of veneers to be glued, adjusted by means of a handwheel and screw spindle. This roll is driven by the lower roll by means of chain.

Start is effected by a pedal and a belt tensioning roller. Stoppage is effected by releasing the pedal while motor is still running, which has the effect that the lower roll in the glue recipient rotates only when veneers pass between the rolls, thus minimizing founing of the glue.

Below the lower roll is arranged a recipient containing glue and adapted to the raised and lowered by lever to secure least necessary immersion of the lower roll in the glue.

Glue is applied without an upper glue recipeint.

The front end of the veneer strip is first immersed into a flat glue recipient in such a way that on removal of the strip from the glue a seam of glue sticks on its upper side across.its width which seam after introduction of the veneer between the rolls is continously pushed by the upper roll along the veneer passing between the rolls and thus ensures application of glue while at the same time the lower roll applies glue from the recipient to the lower side of the veneer strip.

The glue recipient may be by means of a lever set to its lowest position and inclined automatically forwards so that it may be easily cleaned. A drain cock serves for emptying the recipient.

The rigidity of rolls is of particular importance for uniform application of glue. The rolls are therefore made of cast iron provided with longitudinal grooves which secure suitable application of casein and albumine.

If desired the machine may be delivered also:

a) with distributing rolls according to drawing Nr.44947 of which the upper roll is raised together with the upper glue applicating roll. These rolls are provided with fine proved special grooving (in longitudinal and cross direction) for the purpose of uniform distribution of glue and extraordinary economy in glue consumption.

b) as a travelling unit on 3 weels to permit transport of the machine to the place where required.

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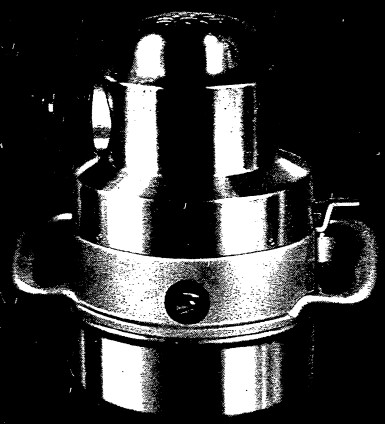

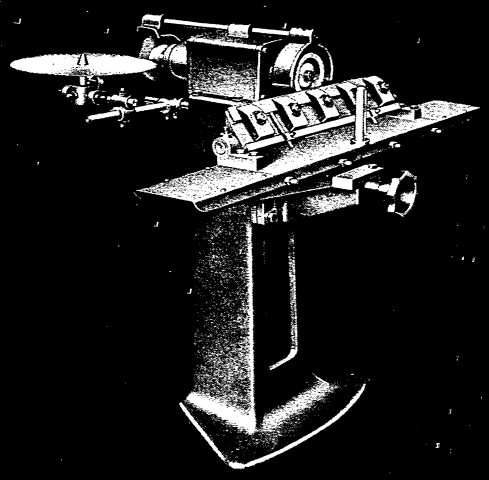

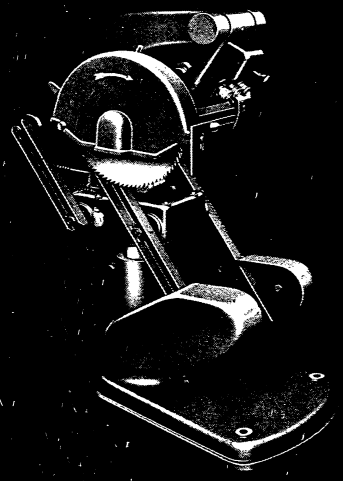

**MOTOKOV**

PRAHA • CZECHOSLOVAKIA • P. O. BOX: 7965 • WIRE: MOTOKOV PRAHA
PRAHA • TCHECOSLOVAQUIE • BOITE POSTALE 7965 • CABLES: MOTOKOV PRAHA
PRAHA • TSCHECHOSLOWAKEI • POSTFACH 7965 • TEL. ADR.: MOTOKOV PRAHA

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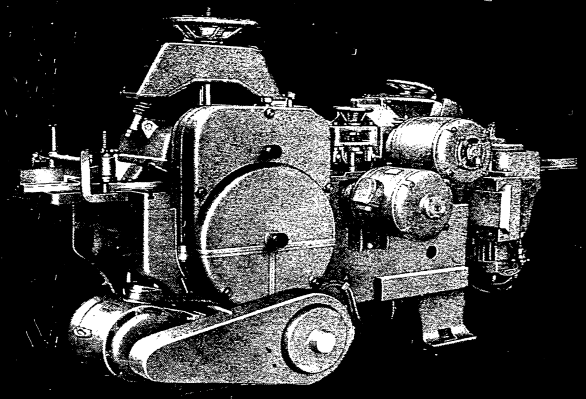

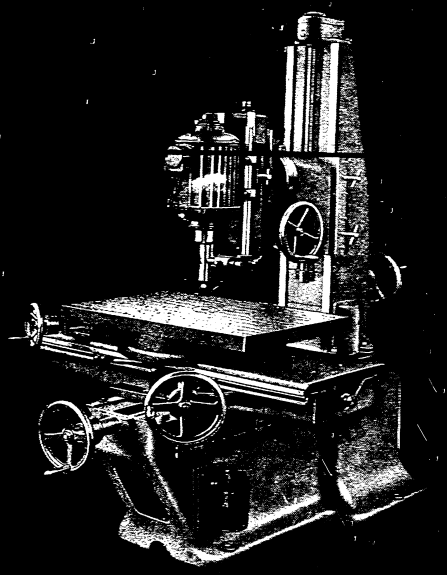

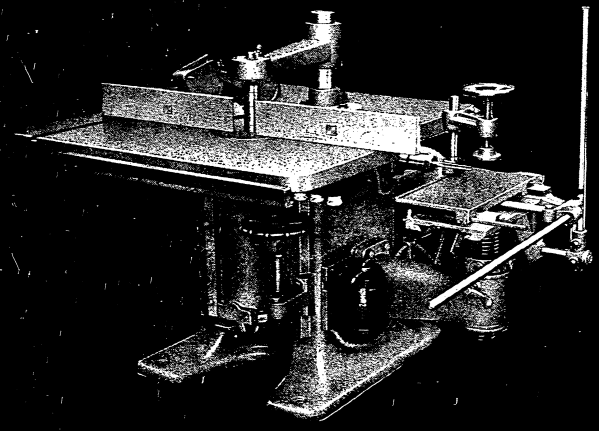

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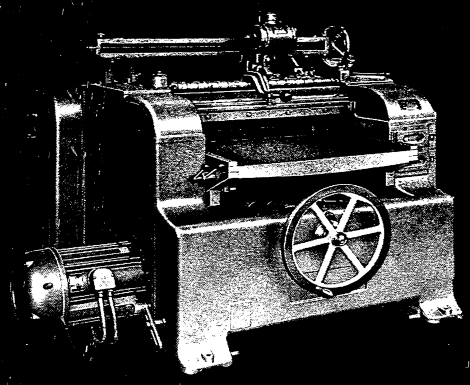

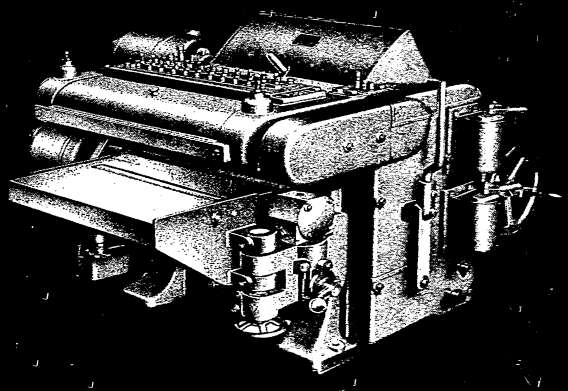

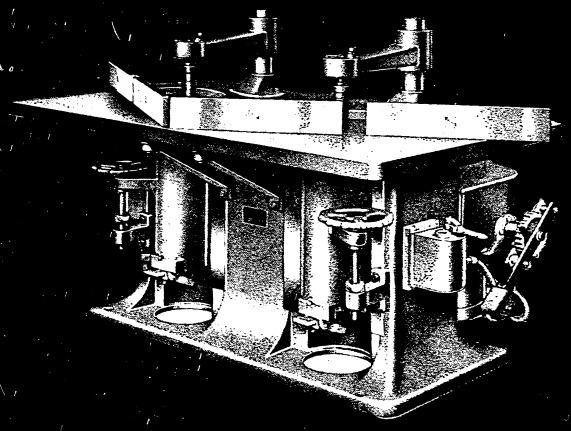

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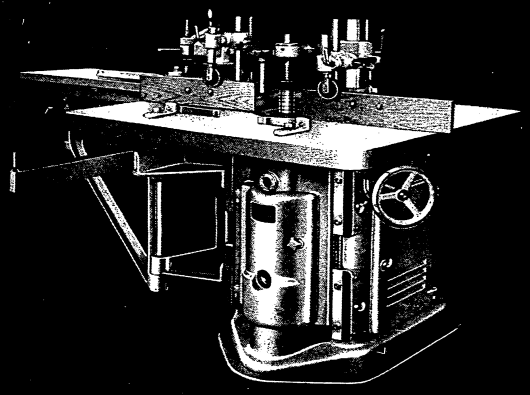
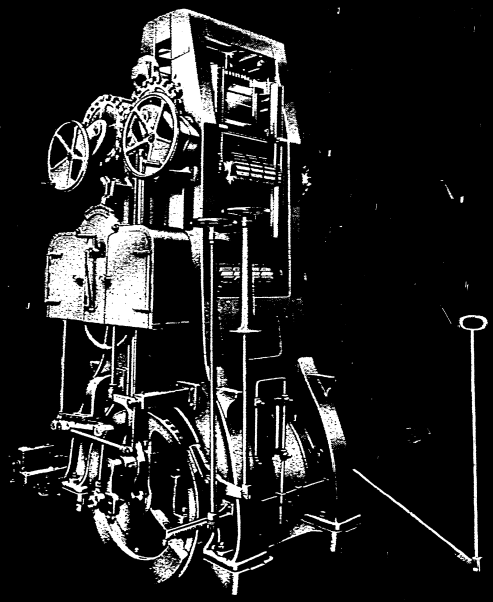
# Export Programme of Woodworking Machines

# Programme d'exportation de machines à travailler le bois

# Holzbearbeitungsmaschinen-Ausfuhrprogramm





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by means of levers the switch is put in or out of action.

Technical Dates:

| | |
|---|---|
| Maximum depht of mortising | 150 mm |
| Minimum & Maximum length of groove | 6 - 40 mm |
| Minimum & Maximum width of groove | 30 - 80 mm |
| Output of the motor | 1,36 HP |
| R.P.M. of the motor | 2800 |
| Voltage (50 cycles) | 220/380 V |
| Maximum heigth of machine | 600 mm |
| Maximum lenght of machine | 390 mm |
| Maximal width of machine | 360 mm |
| Total weight of machine | 26.5 kg |

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...ncy Hand Operated Chain Mortising Machine

T y p e DR - 150.

satisfies all claims on modern Wood working Machinery.

This machine is entended in the first place for the use of Carpenters, but is equally suitable for all other Woodworking operations.

1. The front cover of the electric motor is designed as principal part of the whole machine. It is made, as all shaped parts of the machine from light metal and is amply dimensioned. The front part is designed as a chain cover and protecting device against the ejected wood chips. The top part of the machine is provided with lugs wherein the wooden handle is fixed. Laterally on the central part a vertical guideway is provided wherein the machine is moving up and down during the work. The rear part of the front cover is provided with a threaded flange and serves for mounting the stator of the electric motor and the rear cover.

2. Vertical guide of the machine: During the work the whole machine is advanced through the thrust of both handles downwards. The lift of the machine upwards is effected automatically by the pull of the springs and through a lever mechanism. The mechanism is guided by the two steel uprights the bottom ends of which are engaged within the brackets of the support whilst the other end is fixed in the front cover.

3. Horizontal guide of the machine. The machine is horizontally advanced through its underside on the material worked upon. The feed is enhanced by a steel roller provided on the rear side of the bottom surface of the support, the machine rolling thereon. Both brackets constituting the support of the machine are interconnected by a steel carrier which latter is extended on the one side so that a guiding ruler may be fixed thereon, said ruler serving as a guiding device for longitudinal mortising oras a stop for equal distances of the mortis from the edge of the material worked.

4. Cutting device: the proper cutting and milling of the material is performed by a specially designed link chain connected in an endless manner and driven by a pinion factened to the electric motor shaft. For the cut the chain is guided by a special stretcher bar, the bottom part of which is provided with a guide pulley supported on needle bearings. By such an arrangement a precise and uniform running of the mortiser chain is obtained so that the worked surface is smooth and accurate. The cutting and milling device is formed by the chain, pinion and guiding bar. These three organs are easily interchangeable and are manufactured in various sizes according to the required length and width of the mortised groove.

5. Rear cover: the rear cover closes the top part of the electric motor and on its top part a second handle is mounted for the attendance of the machine, and whereon the motor switching device is mounted in such a manner that by turning the handle

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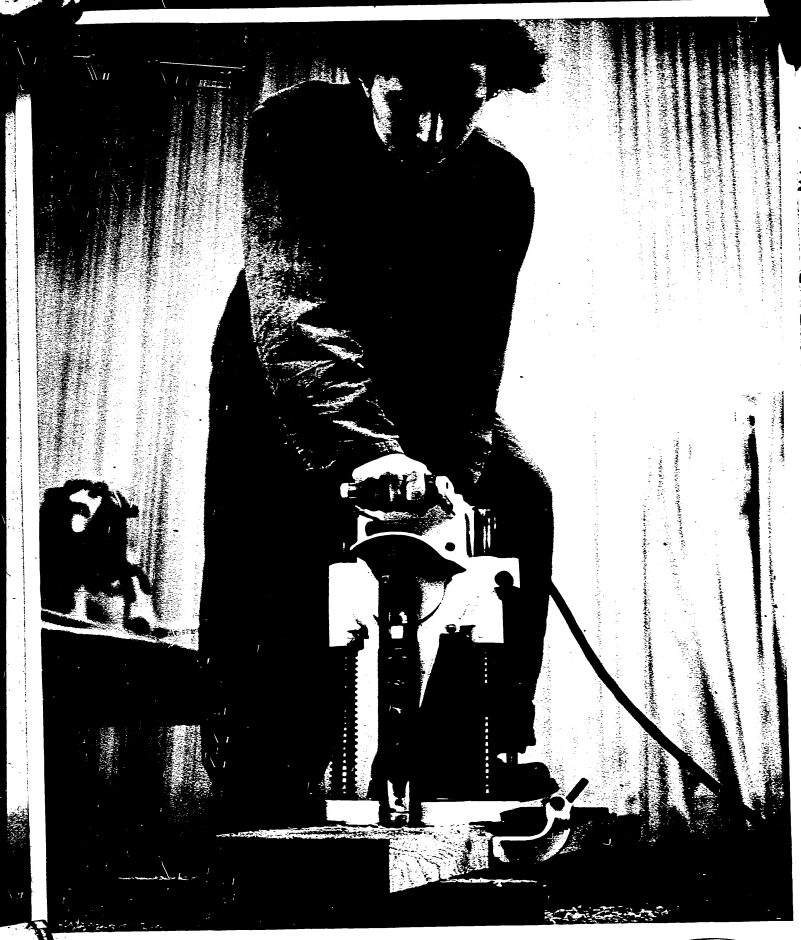

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Cross-cutting

3. Trimming up to 220 cm (7" - 2 5/8") length (precision straight cut, without jointing on the hand planer).
4. Ripping.
5. Mitre cutting.
6. Cutting core panels for the profile plywood.
7. Bevel cutting.

Dimensions and technical data.

| Type | KFH 220 | KFH 260 |
|---|---|---|
| Maximum length of cut (table motion) | 2200 mm | 2620 mm |
| Maximum distance between saws | 2200 mm | 2620 mm |
| minimum distance between saws | 120 mm | 120 mm |
| Distance between machine supports | 2400 mm | 2800 mm |
| Maximum depth of cut | 105 mm | 105 mm |
| Diameter of saw blades | 400 mm | 400 mm |
| Bore of saw blade | 30 mm | 30 mm |
| Size of motors | 4 HP | 4 HP |
| Speed of motors | 2800 R.P.M. | 2800 R.P.M. |
| Motors can be tilted | 90° | 90° |
| Net weight of machine | 1600 kg | 1700 kg |

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## PRECISION DOUBLE CUT-OFF AND SIZING SAW TYPE K F H

Our Double Cut-Off Saw, Type KFH, is successfully applied in various woodworking factories, especially for joinery building work, in manufacture of furniture, in box-making, prefabricating bungalows and cottages etc. where precision parallel and smooth cutting as well as cutting to the right angle is to be carried out. The machine does this duty very easily, quickly and with utmost precision.

The saw blades are arranged above the table, reaching slightly into its surface. Thus they work in the most advantageous position, as they cut with their point. The work is firmly pressed against the table whereby vibrations are eliminated, thus attaining a smooth and precise cut. By applying properly set thicker saws a completely smooth surface of the cut is obtained and, likewise, a precious veneer may be directly glued on. The veneered parts may be also cut precisely to the required size - without their adges having been split off - and according to the venered figure, which is of great importance in series manufacture.

The saw arbors serve as axes of the special three-phase motors of low elongated construction. Thus maximum utilization of the saw blade diameter for the purpose of cutting is secured.

The saw motors can be adjusted for the required length on a long supporting cross beam. Vertical adjustment as well as tilting the motors - even in a vertical position - when bevel cutting is also possible.

The large table with its wooden bed surface is moved by hand on a differential undercarriage on guiding bars of round section. This motion of the table is quite easy and precise.

The saw guards, fitted with an outlet for connection with the suction piping, can be easily removed and enable a quick exchange of the saw blade.

Normally we supply the machine with three-phase motors with a voltage of 380 V, 50 cycles. If required we supply motors for another voltage, which should, however, be indicated in the order.

Process of work:

After the adjustment of the saws the panels are precisely cut to the width. They are laid upon the table and set up along the saw blades traces left in the table surface.

Then the work is pushed against the stops with its cut side, the saw blades are adjusted by the millimeter scale to the required distance and the stock is sized to the right angle.

It is obvious, that in quantity manufacture firstly all cuts to the width are carried out, followed by cutting to the right angle to obtain the required size. In larger factories two machines are installed side by side, each of which performs one operation only. The precision of the cut enables joining of the product without any adjustment.

Figs. 1-7 show the construction details and advantages of the machine.

1. Sizing soft wood-or veneered pieces (first to the length and then to the width, to the precise angle, several boards superposed).

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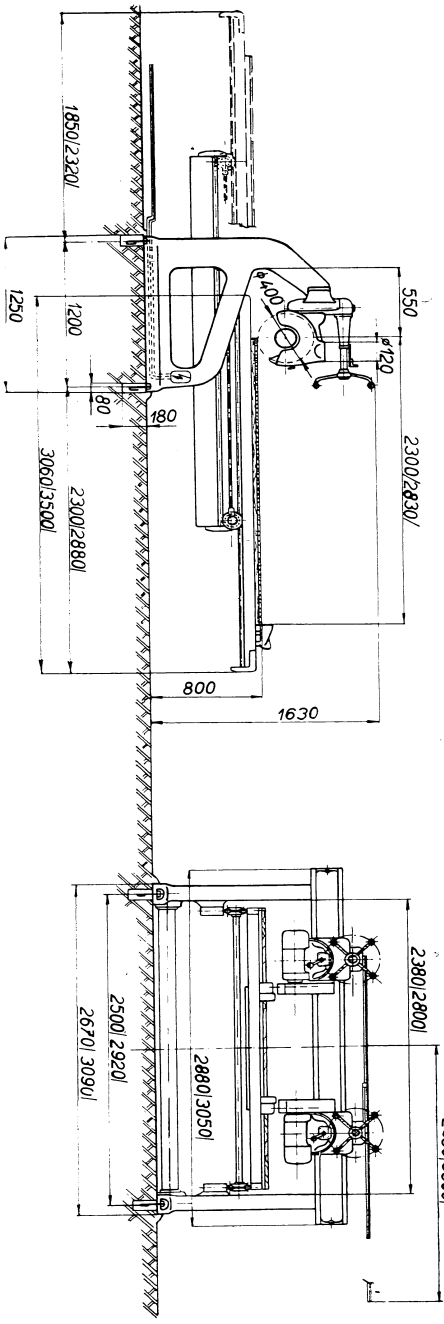
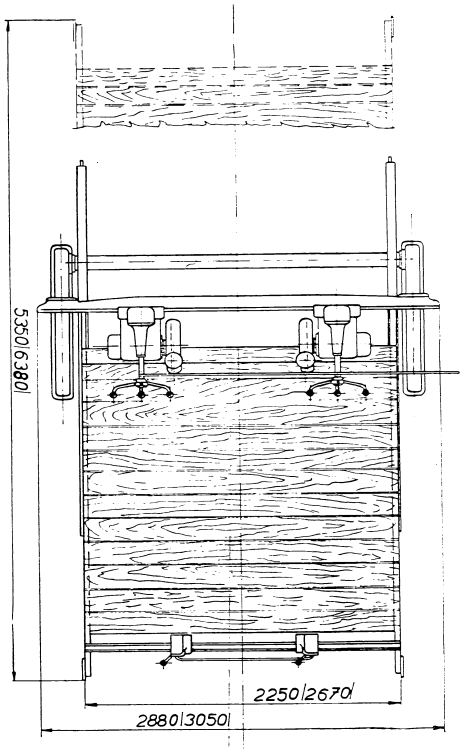



## CARACTÉRISTIQUES PRINCIPALES

| Type | KFH 220 | KFH 260 |
|---|---|---|
| Longueur max. de coupe (course de la table) | 2200 mm | 2620 mm |
| Distance max. entre les lames | 2200 mm | 2620 mm |
| Distance min. entre les lames | 120 mm | 120 mm |
| Écartement entre les montants de la machine | 2400 mm | 2800 mm |
| Hauteur max. de coupe | 105 mm | 105 mm |
| Diamètre des lames | 400 mm | 400 mm |
| Alésage | 30 mm | 30 mm |
| Puissance moteurs | 4 CV | 4 CV |
| Nombre de tours | 2800 T M | 2800 T M |
| Inclinaison moteurs | 90° | 90° |
| Poids net de la machine | 1600 kg | 1700 kg |
| Poids avec emballage de chemin de fer | 1800 kg | 1960 kg |
| Poids avec emballage maritime | 1930 kg | 2100 kg |
| Dimensions de l'emballage maritime | 340×165×140 cm | 344×170×145 cm |
| Nombre de caisses | 2 | 2 |




**INVESTA** SOCIÉTÉ ANONYME POUR L'IMPORTATION ET L'EXPORTATION DES PRODUITS DE L'INDUSTRIE MÉCANIQUE LOURDE, SUCCURSALE

**24/c MALINOVSKÉHO, BRATISLAVA, TCHÉCOSLOVAQUIE**

Imprimé en Tchécoslovaquie - 2701014

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## OPÉRATIONS SUR LA MACHINE

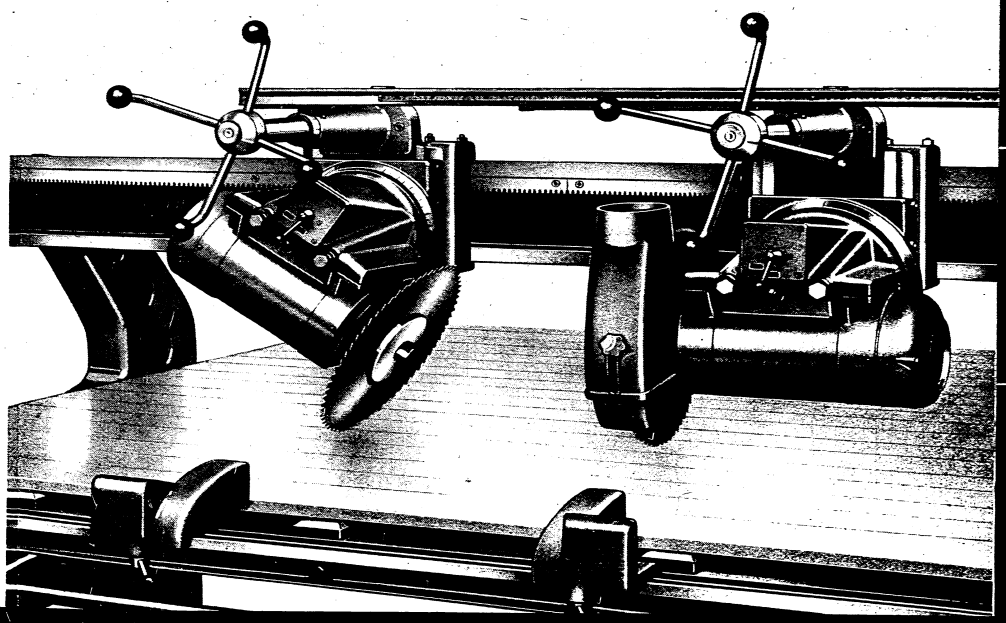
Les panneaux sont dressés à largeur précise, pour laquelle auront été préalablement réglées les lames. On pose ces panneaux sur la table en suivant les traces de coupe délaissées par les lames et visibles à sa surface.

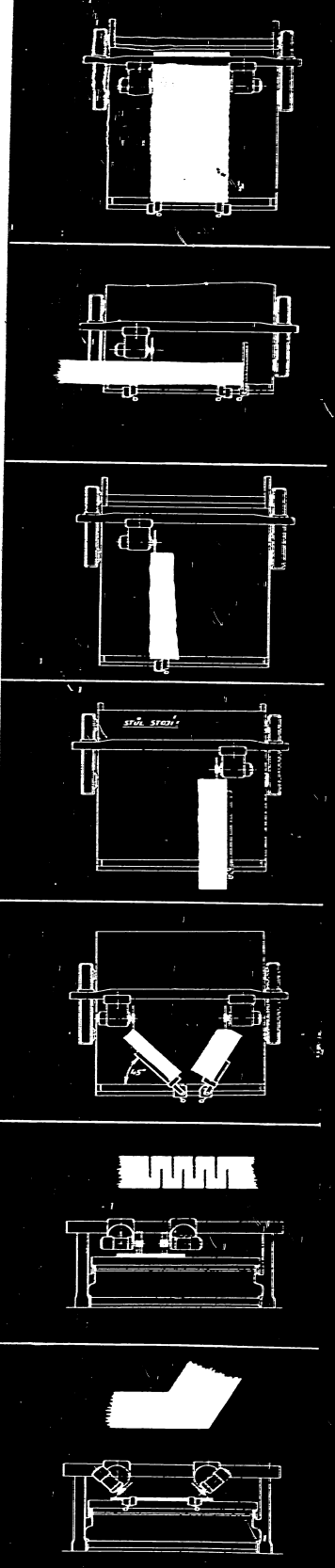
On applique ensuite la pièce par sa face sciée contre les butées, puis on procède au réglage des lames suivant échelle en mm, à distance désirée. On exécute ensuite la coupe parfaitement rectangulaire.

Pour les travaux en série, on devra d'abord effectuer toutes les coupes en largeur et ensuite les coupes rectangulaires. Dans les entreprises importantes, on utilise en général deux machines juxtaposées, chacune d'elles exécutant une opération. La précision de la coupe permet le montage du produit sans aucun travail d'adaptation.

Les détails de construction et les avantages de cette machine sont démontrés sur les fig. 1 à 7.

1. Dressage de pièces en bois tendre ou plaquées (en longueur, puis en largeur à angle précis, plusieurs planches superposées).
2. Tronçonnage.
3. Dressage jusqu'à 220 cm de longueur (coupe droite précise, sans jointage sur la dégauchisseuse).
4. Coupe longitudinale.
5. Sciage à onglet.
6. Entaillage de panneaux en couer pour contreplaquées profilés.
7. Sciage en biseau.





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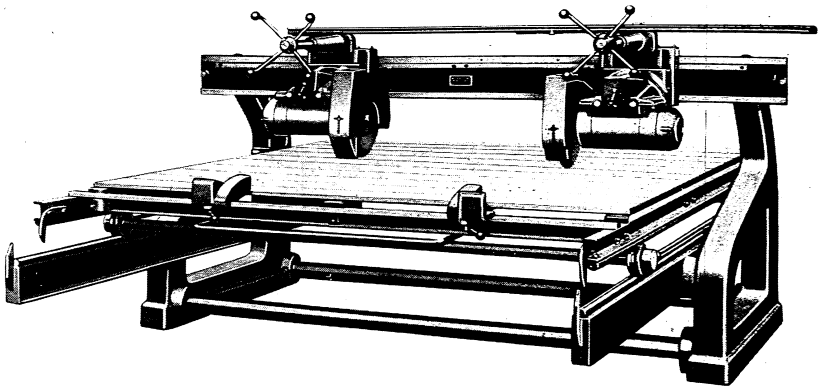

Diverses entreprises de bois, telles que menuiseries, fabriques de meubles, ateliers de wagons, caisseries, usines de maisons préfabriquées etc., produisent un grand nombre de pièces qui exigent des sciages parallèles ou rectangulaires de grande précision.

Notre dresseuse double KFH permet la réalisation de ces travaux très facilement, précisément et rapidement.

Les lames sont montées au-dessus de la table, touchant à peine sa surface. Elles travaillent en position très avantageuse, sciant par leur sommet. La résistance de coupe effectue une pression solide du bois contre la table, d'où absence complète de vibration de la pièce sciée. C'est pourquoi la coupe est parfaitement nette et précise. L'utilisation de lames épaisses à voie rigoureusement uniforme permet d'obtenir une coupe à surface absolument lisse, sur laquelle peut être collé même un placage de haute qualité. Les pièces plaquées peuvent également être dressées à un format de précision suivant la figure plaquée, sans risque de détériorer les bords, ce qui présente bien des avantages pour la fabrication de meubles en série.

Les arbres porte-lames constituent les axes des moteurs spéciaux triphasés, de construction à rallonge et de hauteur peu élevée. On peut ainsi utiliser au maximum le diamètre des lames pour le sciage.

Les moteurs de scies circulaires sont réglables en longueur sur une longue poutrelle de support. On peut aussi effectuer leur réglage en hauteur et les incliner pour les coupes en biseau jusqu'à la position verticale.

La grande table avec surface en bois se déplace à main sur châssis différentiel au moyen de guidage à profil circulaire. Ce déplacement se fait avec facilité et grande précision.

Les protèges-lames sont pourvus de tubulure pour le raccord à la conduite d'aspiration. Ils peuvent s'enlever très aisément, facilitant un changement rapide des lames.

La machine est habituellement livrée pour courant triphasé, tension 380 V, 50 pér sec. Tout autre voltage devra être indiqué à la commande.

**OPÉRA**

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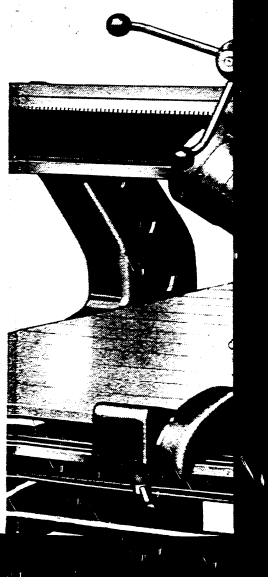

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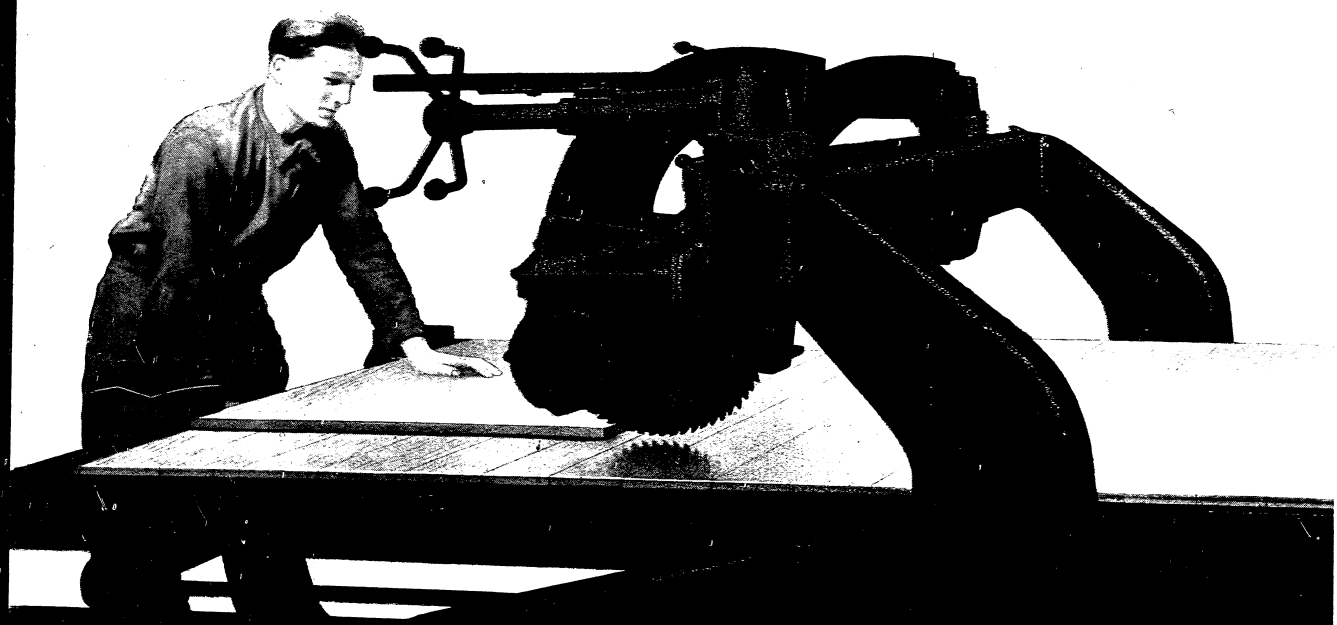
# DRESSEUSE DOUBLE DE PRÉCISION TYPE KFH AVEC TABLE ROULANTE



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the head. The bottom knife can be precisely adjusted to the position of the opposite moving knife. As soon as the edge of the top knife is worn out, the knife itself can be also vertically adjusted in the head as required. For this purpose the top knife is provided with oblong bolt holes. A clean cut is ensured because of the top knife being slightly inclined against the bottom one so that the clipping is effected successively from one end to the other. The vertical motion of the head is enabled by two excentrics on a common shaft, motor driven through a toothed gear and a friction clutch. The head is vertically guided in bronze bushes placed in two strongly dimensioned side frames of the machine guaranteeing precise cut.

The machine is started by pressing down one of the treadles provided on both side frames. Thereby the friction clutch arranged on the main shaft is immediately put into action. By a single revolution of the main shaft which corresponds to one stroke of the knife, the clutch is disengaged — in case the operation treadle is not pressed down — and the head is stopped in the top position. In order that the head does not get into motion from its top position by its own weight, the clutch is furnished with a band brake working only in the upper part of the stroke. The cut material is moved forward on a short wooden table placed on the front of the clipper. These clippers cut single veneers or veneer strips, up to the max. thicknes of 6 mm ($^1/_4$").

Following sizes are produced according to the maximum length of passage:

| Type | | CN 1800 | CN 2400 | CN 2800 |
|---|---|---|---|---|
| Cutting length | mm | 1800 | 2400 | 2800 |
| | in. | 70 | 94 | 110 |
| Net weight approx. | kg | 1050 | 1170 | 1260 |
| | lbs | 2310 | 2570 | 2770 |
| Seaworthy packing | kg | 315 | 360 | 410 |
| | lbs | 690 | 790 | 900 |
| Railway packing (crating) | kg | 140 | 160 | 180 |
| | lbs | 310 | 350 | 400 |
| Cubature (seaworthy packing) | $m^3$ | 3,6 | 5,4 | 6,9 |
| | cub. ft. | 127 | 190 | 253 |

As normal accessories we supply with the clipper:
1 top knife on the machine
1 bottom knife on the machine
1 motor, performance 5,5 HP, RpM 1440, with accessories,
foundation bolts and
spanners.

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METAL & ENGINEERING PRODUCTS AND RAW MATERIALS TRADING COMPANY
MALINOVSKÉHO 24/c, BRATISLAVA · CZECHOSLOVAKIA · Cables: Slokov Bratislava

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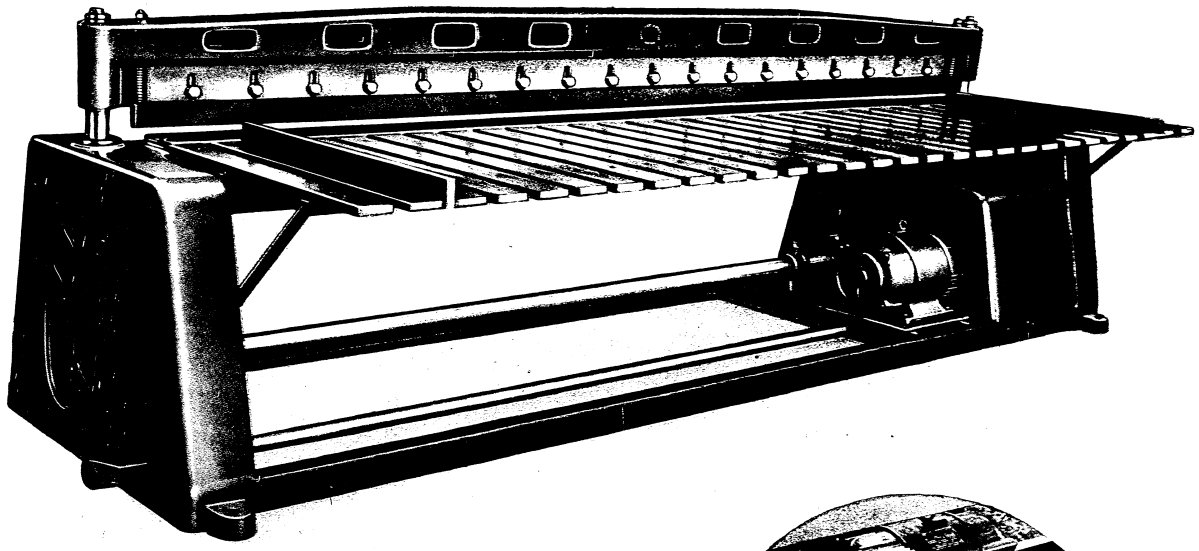

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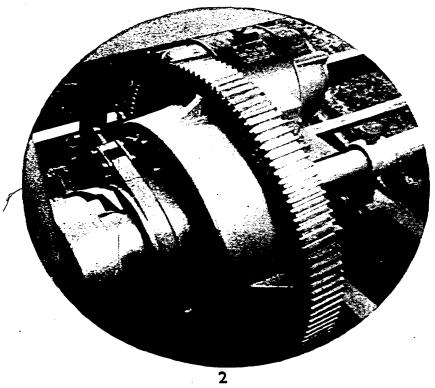
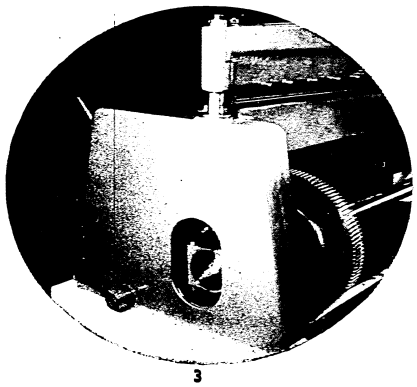
# Electric Veneer Clipper TYPE CN



2

The clippers are indispensable in veneer production, especially in sizing veneer strips or clipping off faulty parts of veneers. It successfully replaces and outstrips various older types, such as clippers for treadle drive and the like.

The clipping equipment consists of two knives the bottom one of which is firmly fixed onto the machine table. The top knife is movable and fixed on



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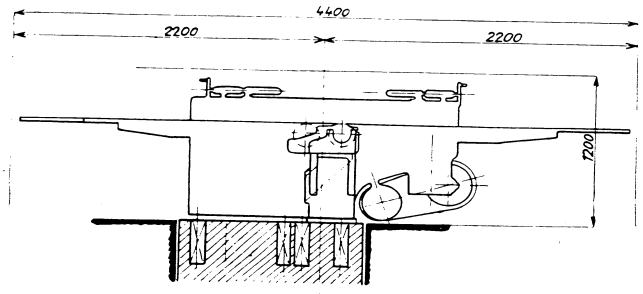
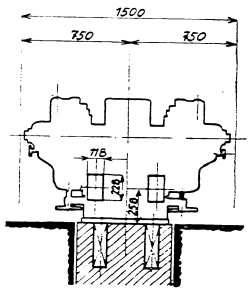
# SPECIFICATION

| | | | |
|---|---|---|---|
| Dimensions of jointed plank: | | | |
| Minimum length | mm | 200 | 8″ |
| Minimum thickness | mm | 5 | $^3/_{16}$″ |
| Maximum thickness | mm | 80 | $3^1/_8$″ |
| Minimum width | mm | 20 | $^3/_4$″ |
| Maximum width | | any | |
| Diameter of cutter heads | mm | 180 | $7^1/_{16}$″ |
| Width of knives | mm | 100 | 4″ |
| Feed rates | metres per minute | 6—8.5—12—17 | |
| | feet per minute | 19.5—28—40—56 | |
| Cutter head motors: output | kW | 2.2 | |
| speed | R. p. M. | 2800 | |
| Feed motor: output | kW | 1.5 | |
| speed | R. p. M. | 920 | |
| Weight of machine | kg | 1990 | 4400 lbs |
| Shipping weight of machine: ordinary packing | kg | 2110 | 4650 lbs |
| seaworthy packing | kg | 2490 | 5500 lbs |
| Contents boxed | $m^3$ | 12.6 | 450 cu. ft. |

IN ORDERING SPECIFY VOLTAGE, PHASE AND FREQUENCY OF POWER SUPPLY.

As improvements in design are continualy being made, this specification is not to be regarded as binding in detail, and dimensions are subject to alteration without notice.

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hinged on the column and drives the gear box by a short V-belt. The pulleys are 4-step ones to give four feed rates.

The endless feed chain consists of a series of accurately manufactured plates grooved on their surface. The plates are joined by a chain. The timber being machined is pressed against the feed chain by a series of rollers which are individually spring-loaded. Apart from that the whole girder carrying the rollers is also spring loaded. This arrangement protects the machine in case a thicker plank is inserted. The hold-down rollers are arranged at either side of the machine and the two girders are adjusted individually by a hand wheel to the required thickness of the plank.

The cutter heads are easily removable. Special tools for the milling of various shapes can be inserted into the machine in place of the cutter heads.

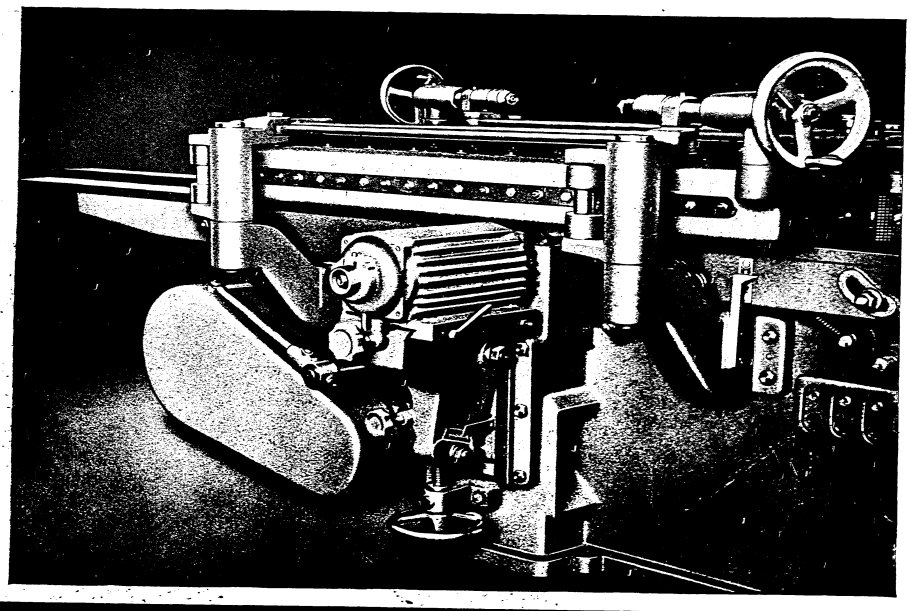
The motors of the cutter heads are of a special extended design, totally enclosed and provided with cooling ribs. The feed motor is also enclosed.

All the moving parts of the machine are protected by guards.

The electromagnetic contactors are mounted in the column. The motors are controlled by push buttons. The machines may, on request, also be supplied equipped with drum type switches instead of contactors and push buttons.

## STANDARD EQUIPMENT

2 cutter heads dia. 180 mm ($7^{1}/_{16}$″) with four straight knives for plain jointing, complete electrical equipment including motors, switches and fuses, set of spanners, operating instruction booklet.



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# DOUBLE-ACTING JOINTING MACHINE

# HSB

## DESCRIPTION

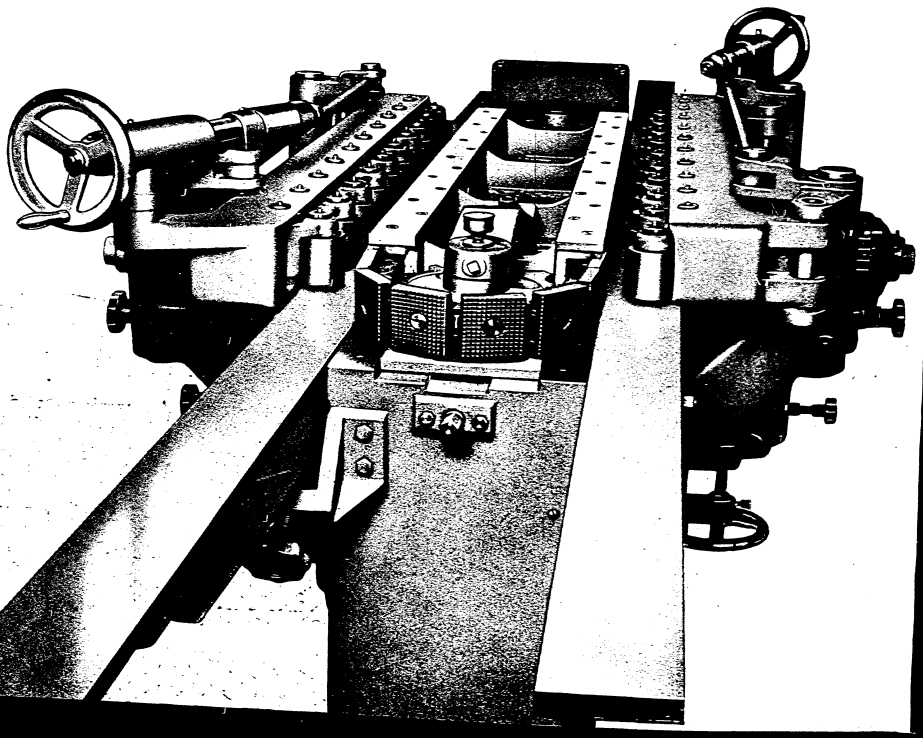
The machine is operated by two workmen. The plank inserted by the first workman is jointed on one edge during its first passage through the machine. It is then turned over by the second workman and inserted at the other side of the machine where its other edge is jointed during the return passage. For groove and tongue jointing the groove is cut at one side of the machine and the tongue at the other side.

An outstanding feature of this Double-acting Jointing Machine is the accurate guiding of the feed chain. The plank is firmly pressed against the chain and receives a positive movement from it. Therefore the operation of the machine does not require particularly skilled workman as compared with jointing planers with hand feed where the accuracy of the joint made depends on the skill and judgement of the operator and requires careful and slow work.

## DESIGN

The machine consists of a box type column carrying, at either end, long levelling tables made of steel. Each of the two front tables is vertically adjustable to suit the depth of cut. The rear tables are fixed and the cutter heads are adjusted for height accordingly. The cutter heads are provided with four knives and mounted on the extended shafts of special electric motors which are vertically adjustable and, beside that, can be tilted to enable planks to be jointed not only at right angles, but also at any other angle.

In addition to two electric motors to the shafts of which exchangeable cutter heads are fitted the machine also has a separate motor for driving the feed mechanism. The feed motor is



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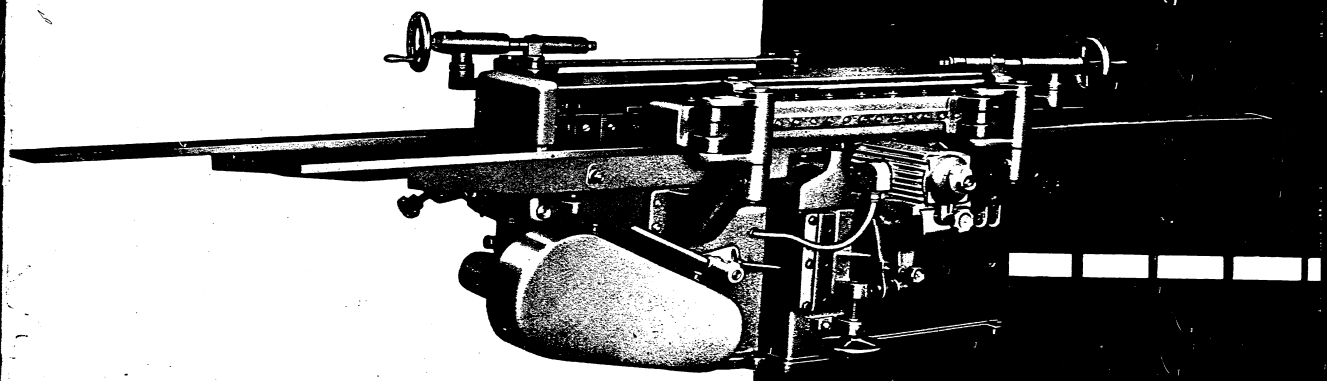
*Type*

# HSD

# DOUBLE-ACTING JOINTING MACHINE

This Heavy Duty Precision Machine is intended for the jointing of planks and is particularly suitable for woodworking plants where a large amount of jointing work is being done. The machine can be used for jointing, i. e. planing of edges, of any length, either parallel or with a taper, of planks with thicknesses from 5 to 100 mm. The joint can be either rectangular or slanting. The achieved accuracy of jointing ensures perfect gluing of planks.



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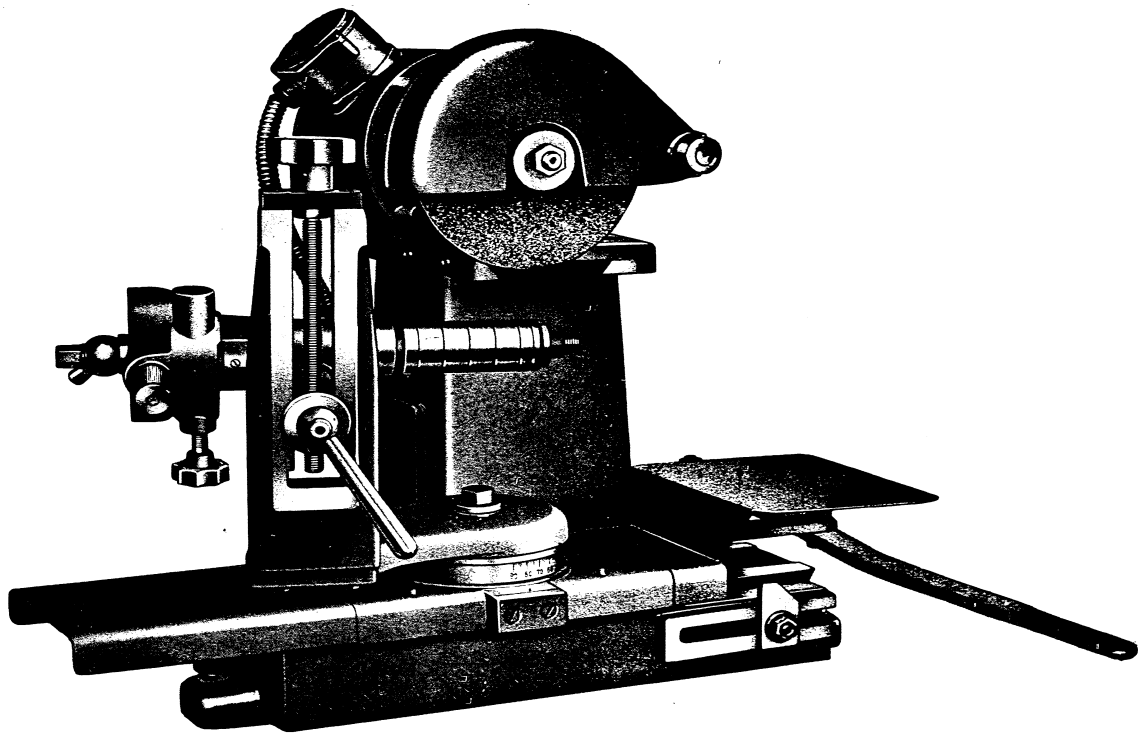

**Accessories:**

1 carborundum grinding wheel — 175 mm dia. (6,9″)
1 mandrel 25 mm dia. (0,98″) with a set of distance rings,
1 mandrel 30 mm dia. (1,18″) with a set of distance rings,
1 dividing wheel with 24 teeth,
1 dividing wheel with 30 teeth,
1 switch with complete electrical installation,
1 set of tools.

**Dimensions and technical data:**

| | |
|---|---|
| Diameter of grinding wheel | 175 mm (6,9″) |
| Maximum dia. of cutters (heads) | 200 mm (7,87″) |
| Maximum width of cutters | 100 mm (3,93″) |
| Maximum angle of cutting edges | 35 |
| Mandrel diameters | 25 and 30 mm (0,98″ and 1,18″) |
| | 25 and 30 mm (0,98″ and 1,18″) |
| Motor | 0,55 kW, approx. 0,75 HP, 2800 rpm |

The following dividing can be carried out by wheel with 24 and 30 teeth: 2, 3, 4, 5, 6, 8, 10 and 12.

Dividing wheels with 27 or 28 teeth for tools with 7 or 9 cutting edges can be supplied on extra order.

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BRANCH OFFICE, GORKÉHO 8, BRATISLAVA, CZECHOSLOVAKIA

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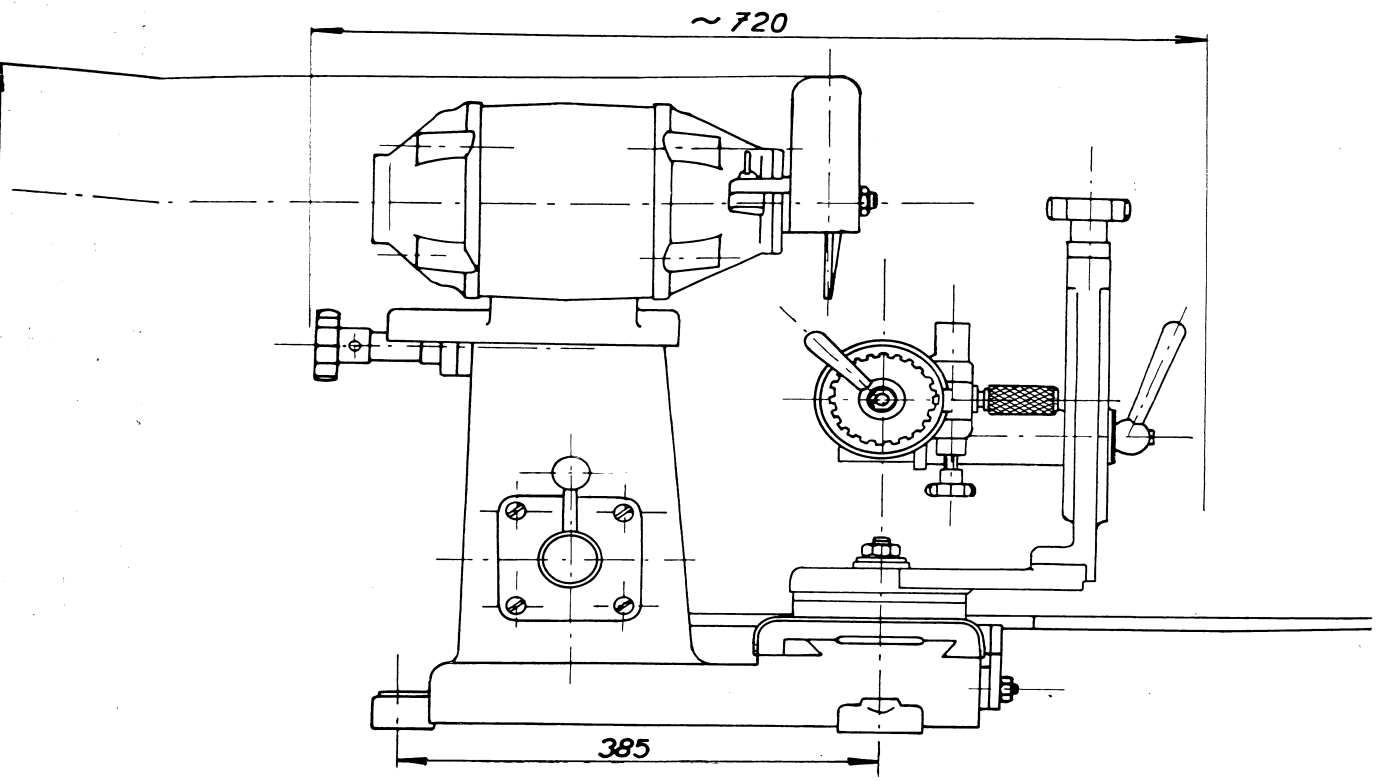


Accurate setting of further cutting edges is performed by a dividing wheel. The required cutting edge angle is set by shifting the grinding wheel in the direction of the motor axis. The special-grain grinding wheel is protected by a guard and is directly fitted to the motor shaft. It is moving together with the motor in the top prismatic guide of the stand. The protective guard can be placed aside when replacing the grinding wheel and permits a wheel of a maximum diameter of 200 mm (7 7/8″) to be used.

The carriage with the revolving stand and a mounted tool are moving in a prismatic guide by means of a hand lever and their lifting is limited by an adjustable stop.

Special three-phasse, squirrel-cage motor for 220 and 380 V, 50 c. p. s. is supplied. If other type of motor is required, this must be stated expressly in your order.

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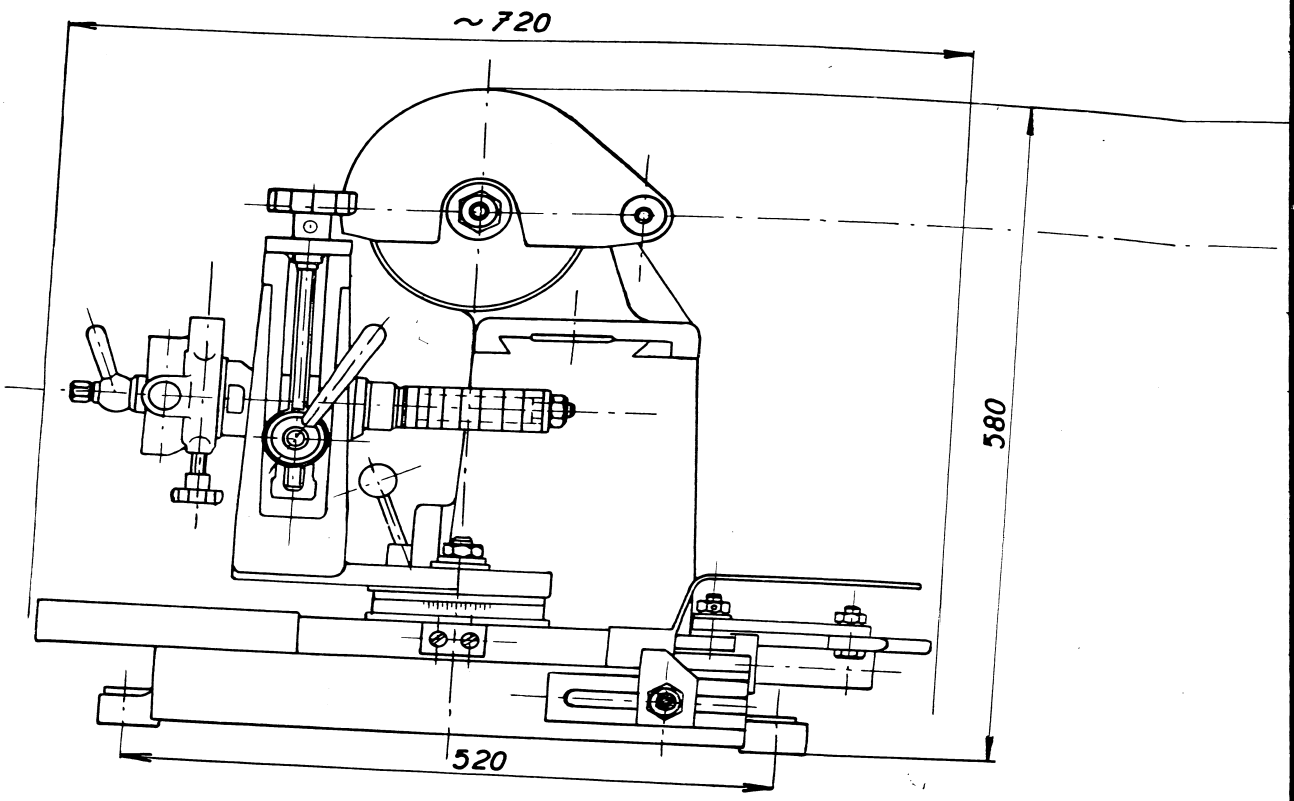


The machine is mainly intended for sharpening cutters but it can be successfully used for sharpening various forming tools clamped in special cutter heads (e. g. for three-sided and four-sided planers, for parquet-making or jointing machines, etc.).

All plain and bevel gear cutters with straight and helical teeth can be ground on this machine. By elevating the mandrel according to the diameter of the sharpened tool, by tilting the mandrel when sharpening bevel gear cutters and by revolving the stand, the machine is readily set up for any tool. A protractor scale is provided for cutters with helical and bevel teeth.

The tools are held on a mandrel which is easily interchangeable to enable tools with various bores to be fitted. The fitting of the tool on the mandrel is very simple. Parallel alignment of the tool's cutting edges with the grinding wheel is obtained by turning the mandrel with a star wheel.

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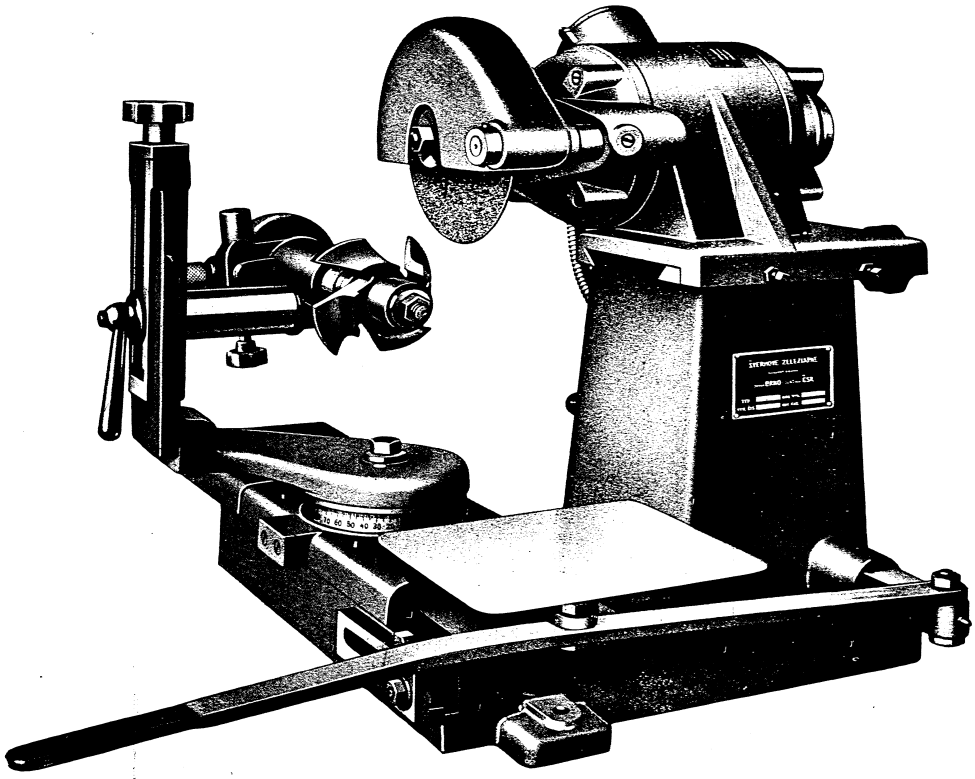
# NBF TOOL GRINDER FOR CUTTERS AND CUTTER HEADS



To make the best of sharpers it is necessary to maintain the cutters well sharpened. This NBF tool grinder, therefore, is indispensable in all plants where wood is machined. It ensures perfect grinding even by unskilled labour.

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The table is fitted with a pendulum piece mounted behind the chain on the outfeed side of the machine, ensuring perfect operation of the feed chain in case trimmed pieces should get between the chain and the table.

The feed chain is driven from the saw shaft by means of the speed box and the toothed gear. Therefore the feed speed of wood depends upon the cutting speed of the saw blade. On occassional overloading of the machine the saw blade speed slows down simultaneously with the proportionally reduced feed speed.

Changing rates of feed is effected by moving the sliding gears in the speed box. Six rates of feed are obtained by applying two levers, i. e.: 9 — 13 — 18 — 25 — 36 — 50 m/min. The suitable feed rate is fixed according to the kind of wood to be cut and its thickness as well as according to the momentary condition of the saw blade. At the highest rates of feed more than two workmen must be employed. Full utilization of the machine is achieved only when supply as well as removal of the stock is well organized.

The feeding can be immediately stopped or started by applying two treadles provided at both ends of the machine. Therefore the feeding can be stopped even by a workman standing at the discharge end of the machine.

When cutting wood of the same width in series, use is made of a ripping gauge which is moved to various widths on the transversal guide provided with a millimeter-scale. The ripping gauge is used for cutting on both sides of the saw blade.

When cutting, the machine produces plenty of sawdust which should be drawn off. The velocity of air-flow destined for drawing off should be 25—35 m/sec. The suction outlet is in the upper part of the feed pressure works.

The driving electromotor is a three-phase asynchronous double slotted squirrel-cage motor by means of which the machine is started without a considerable rush of current. Starting is effected by means of a star-delta switch. The continuous output of the motor is 8 kW at 2800 R.P.M. The motor can be overloaded by double the effect for a short time which is a valuable feature of this machine.

Normally we supply the machine with an electromotor for a working voltage 3×380 V and 50 cycles. The order is to indicate the required working voltage between the phases of the motor-network and the number of cycles, i. e. 3×380 V, 50 cycles or 3×500 V, 60 cycles, etc.

**Accessories:**

Following accessories are usually supplied:

1 circular saw blade 350 mm with a hole of 30 mm diam. and
1 set of necessary special spanners and wrenches.

For starting the motor one star-delta switch with fuses and complete electrical outfit on the machine.

**Specifications:**

| | | |
|---|---|---|
| Type | KOH | |
| Diameter of saw | 350 mm | 14 in. |
| Saw hole | 30 mm | 1¼ in |
| Depth of cut up to | 100 mm | 4 in. |
| Rates of feed m/min. | 9—13—18—25—36 and 50 | |
| ft/min. | 30, 43, 59, 82, 118, 164 | |
| Height of table | 800 mm | 32 in. |
| Width of table | 950 mm | 37 in. |
| Length of table | 1600 mm | 63 in. |
| Distance from saw to left edge of table | 400 mm | 16 in. |
| Distance from saw to main arm | 450 mm | 18 in. |
| Shortest stock handled, approx. | 250 mm | 10 in. |
| Built-in saw motor | 8 kW/2800 | R.P.M. |
| Net weight of machine | 1670 kg | 3690 lbs |
| Gross shipping weight of machine (with railway packing) | 1850 kg | 4085 lbs |
| Boxed for export (seaworthy packing) | 2030 kg | 4480 lbs |
| Cubature of seaworthy packing | 5,4 $m^3$ | 190 cft. |

We reserve the right to improve and change the construction and therefore the indicated measures, weights and illustrations are not binding.

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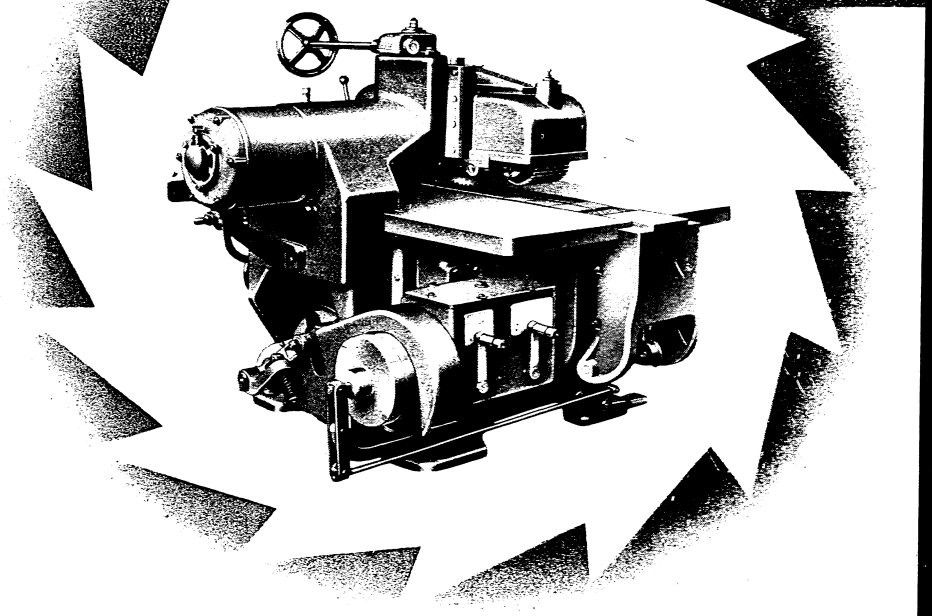

is triple placed in precision ball bearings. The saw blade is arranged above the table and reaches with its toothing into a narrow groove cut in the middle of the feed chain width. Thereby the saw blade is in its most advantageous position against the cut wood. It cuts with its highest point. The saw blade does not vibrate, as it is well guided. It is adjustable to the required height only according to how much its diameter decreases by grinding.

The circular saw blade is situated in the centre of the feed pressure works in which the pressure rolls and pulleys are placed. One pressure roll is placed in front and the other behind the saw. On the sides of the saw blade four pressure pulleys are situated. The rolls as well as the pulleys are placed in ball bearings in independent carriers and are held against both the wood and the feed chain by means of helical springs. Thereby the stock is thoroughly fed by a straight feed chain travel against the circular saw blade.

The feed pressure works are adjustable to the required height according to the thickness of the material to be cut. Small differences in the wood thickness do not require precise adjustment to the height. The adjustment of this mechanism is controlled by a millimeter-scale.

The feed chain consists of a row of precise small links hinge-joined to each other, sliding on the accurate prismatic guide mounted under the table level. The guide face is built in such a way that even after many years of hard service and heavy wear the machine does not suffer and the straight cut is not impaired.

This prismatic guide is well lubricated with oil while the machine is running. For this purpose the machine is equipped with a lubrication press driven from the feed pressure works. The press has 5 outlets from which small tubes lead to the places of lubrication of the guide face and to the chain links. It is sufficient to control the oil level in the respective oil container and to fill up the same in right time.

In front of the infeed pressure roll there is a kick-back guard. It catches the stock or its trimmed pieces which are sometimes thrown back by the saw blade. It protects the workman aginst injury. This equipment can be disengaged by applying a small hand lever.

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# High Speed Straight Line Ripper with Chain Feed Type KOH

**Application.**

In most of the wood-working factories the wood pieces are roughly cut with a universal circular saw with hand feed. This process is not only lengthy but often not precise enough. A straight line cut is very seldom obtained. Therefore, if wood pieces are to be glued together in the joint, it is essential to cut broader pieces in order that a precise joint can be planed on the hand planer. Thereby considerable losses of material arise.

The Straight Line Ripper with Chain Feed illustrated in this prospectus cuts in a perfectly straight line and, moreover, achieves an unusually high output. This machine easily replaces several ordinary circular saws. It saves much on wages and room. Short pieces as well as pieces of any length can be cut on this machine with such accuracy that the cut pieces can be glued together in the joint even without planing.

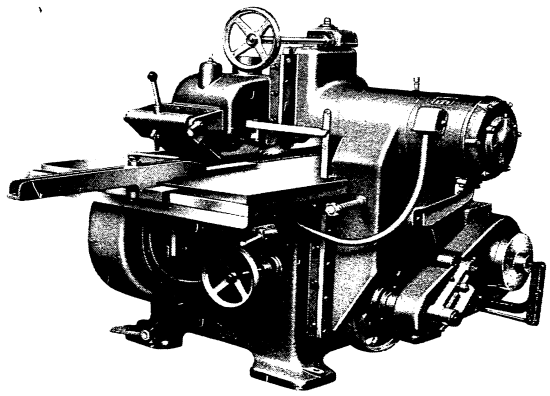
Owing to unusually high output and accuracy of cut this machine is indispensable not only to larger factories employing series manufacture, but is versatily applicable in average wood-processing factories. Especially in furniture factories where, next to high output, highest utilization of material is demanded nowadays, this machine repays itself by the attained savings in a short time.

**Technical description.**

The main frame is a heavy casting of case shape. It is amply ribbed. Due to the robust construction as well as a large foundation surface the machine guarantees permanent stability.

The three-phase electromotor is supported by the main arm and forms a unit with the same. It has a prismatic guide on the right side of the main frame and is adjustable to the required height by a hand wheel and a strong screw spindle.

A circular saw blade of a diameter of 350 mm is placed on the elongated motor-shaft. The shaft



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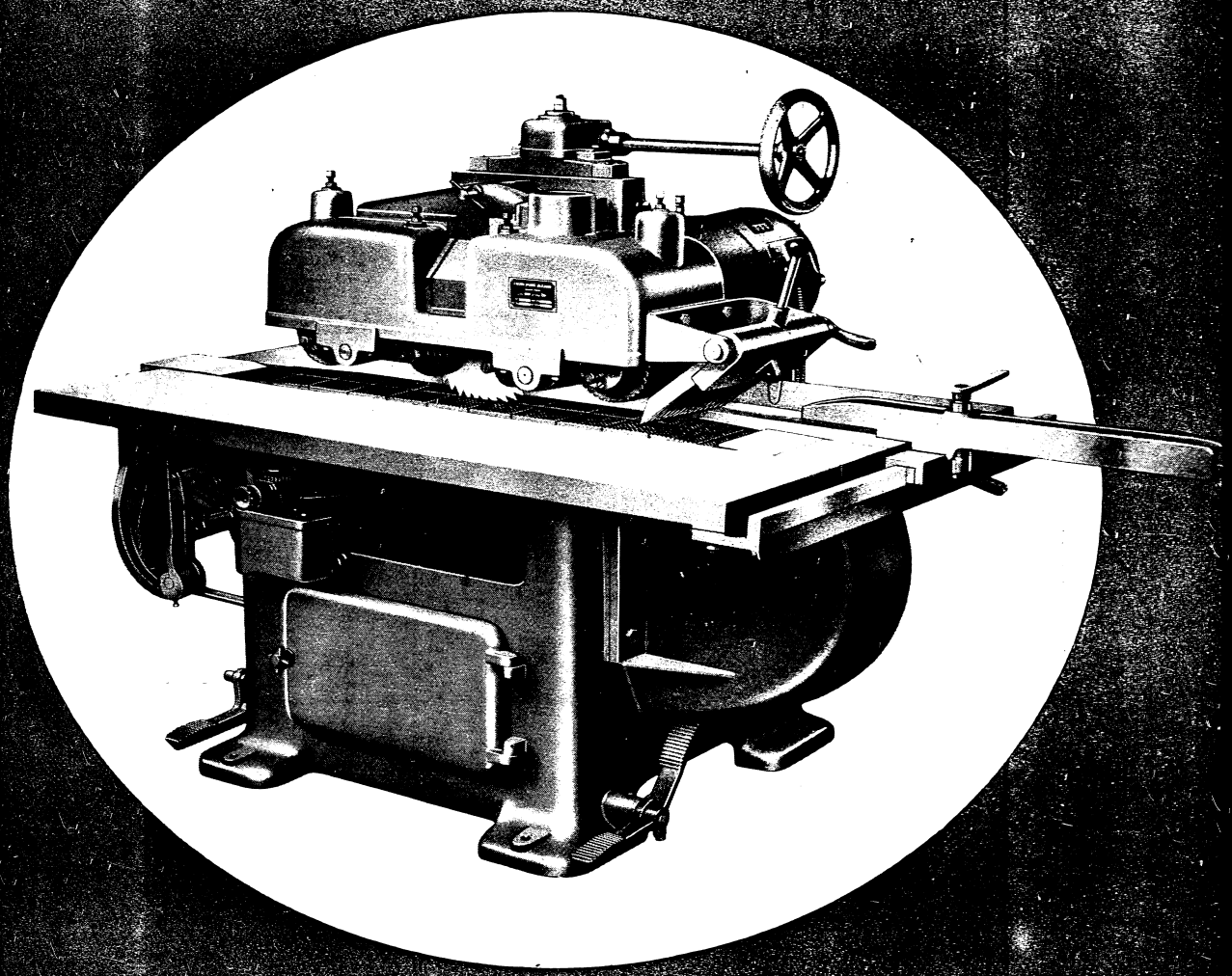
# HIGH SPEED STRAIGHT LINE RIPPER
## WITH CHAIN FEED



**Type KOH**

KOYO

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short period should heavier work be handled. The switch for starting the motor is fitted under the front part of the table.

The machine is normally supplied with a motor for 220 or 380 V, 50 cycles. We advise our customers to precisely state the power supply available when compiling their orders.

**ACCESSORIES:** 1 circular saw blade 350 mm dia. (13.8″), bore 30 mm (1.18″),
1 arbour with flange nut,
1 switch with fuses and a complete electric installation,
1 set of spanners and special tools for servicing.

## TECHNICAL DATA:

| | | |
|---|---|---|
| Diameter of circular saw | 350 mm | 13.8″ |
| Diameter of bore | 30 mm | 1.18″ |
| Maximum cutting height | 80 mm | 3.15″ |
| Maximum width of cut: | | |
| a) at 90° cross cutting | | |
| of boards up to 45 mm (1.77″) thickness | 500 mm | 19.68″ |
| of boards up to 80 mm (3.15″) thickness | 470 mm | 18.50″ |
| b) at ripping | | |
| using front guide | 700 mm | 27.56″ |
| using rear guide | 900 mm | 35.43″ |
| Table dimensions: | | |
| width | 900 mm | 35.5″ |
| length | 1930 mm | 76″ |
| height | 760 mm | 30″ |
| Electric motor | 2.2 kW, 3 HP, | 2,800 r. p. m. |
| Weight of machine: | | |
| net weight | 420 kg | 925 lbs. |
| in railway packing | 550 kg | 1210 lbs. |
| in overseas packing | 715 kg | 1570 lbs. |
| Cubic capacity of overseas packing | 4.5 m³ | 125 cu. ft. |

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of the machined part. The motor carriage can be rigidly clamped to the arm at any distance of the saw from the guide.

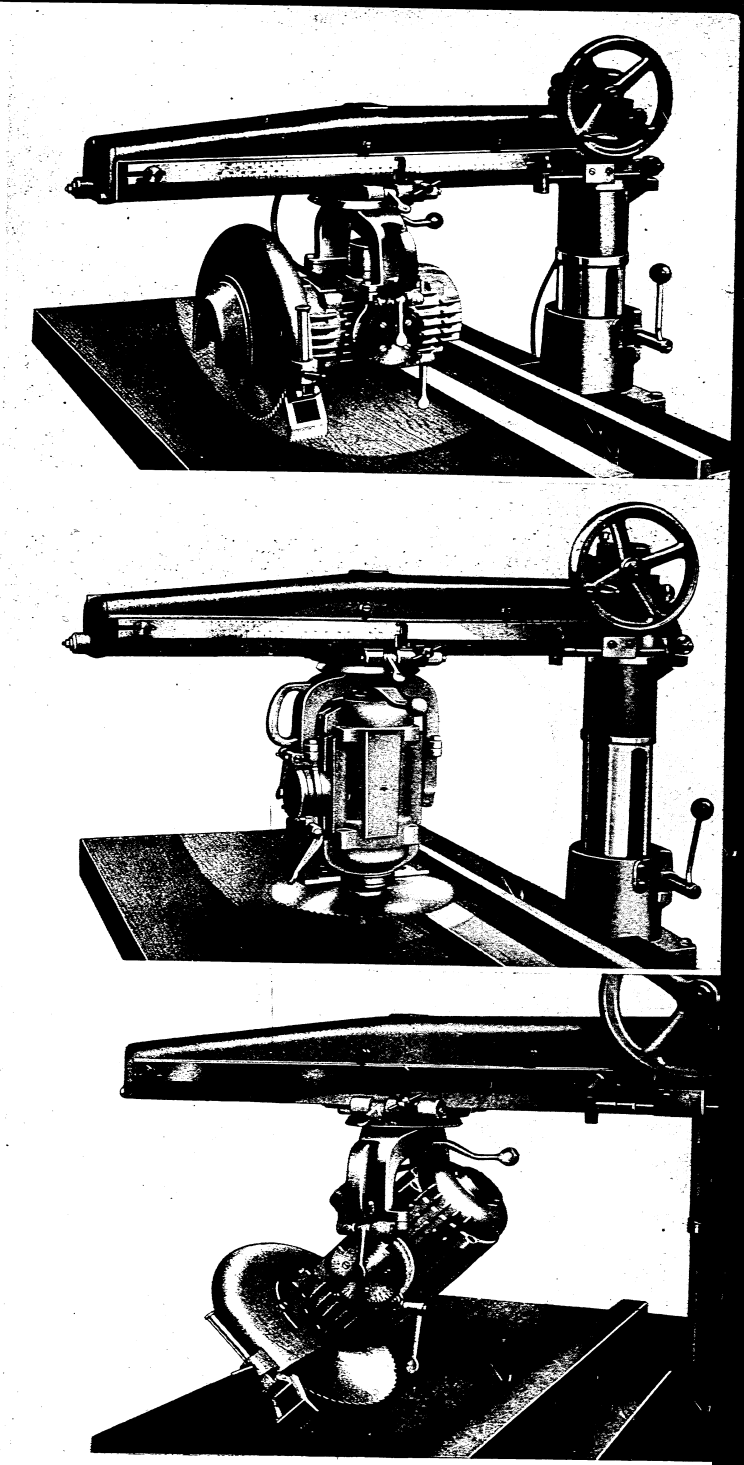
The machine is prepared for **other types of work** by removing the saw blade and its arbour which is screwed in the motor shaft. The appropriate arbour is then fitted. We can supply arbours made to your specifications, but this is charged extra. These are, for example, arbours with a slit for fitting simple tools for **profiling, tenoning, routing,** for **window shaping, door shaping,** for fitting **tonguing cutters** etc.

The motor is set upright for this type of work and for height it is set by the handwheel on the arm. The table plate is of wood and is fitted on a sturdy cast table giving the machine a 100% rigidity.

**All machine parts** which are to be maintained in an absolutely parallel or right angle position in relation to other parts are so constructed that by simple screwing these positions can accurately be set. This particularly concerns the 90° position of the arm in relation to the guide and the alignment of the saw with the arm guide way.

**The electric motor** on the shaft of which the various tools are fitted is of the **three-phase, squirrel-cage induction type** and is fully enclosed.

In order to increase the **cooling of the motor** its stator frame is heavily ribbed. The motor can be substantially overloaded for a



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# KRU · universal arm circular saw

If your workshop is in need of a versatile machine to cover various operations, then, KRU universal arm circular saw is truly ideal.

**The principal tool** is the 350 mm dia. (13.8") **circular saw.** Cross cutting or any mitre cutting by swinging the arm is easily performed. Bevel cutting is carried out by tilting the motor. By slewing the motor carriage on its vertical axle and by setting the saw to the appropriate distance from an adjustable guide various parts used in the builders joinery, in furniture manufacture, in box-making, etc. can be ripped.

If **other tools** are to be employed in place of the saw, e. g. **cutter heads, tenoning discs, swing grooving saws, tonguing cutters, dado cutters, etc.,** remove the saw and its arbour. The appropriate arbour for your tool can then be fitted into the bore in the motor shaft.

**Right angle cross cutting** is performed with the arm locked by an indexing pawl. Smooth travel of the motor with the saw in the arm guide way is facilitated by ball bearings carrying the carriage. Front and rear stops are fitted. An important feature of this KRU UNIVERSAL is the fact that during the operation the wood need not be held down or even pressed against the table and the guide, as this is well performed by the saw itself. Once the saw enters the wood no manual holding is necessary.

**Mitre sawing** is made possible by simply swinging the arm to the left or to the right whilst the appropriate angle is indicated on the column scale.

**Bevelling** of any angle can be carried out by tilting the motor mounted in the carriage. An angle scale for this purpose is fitted on the front side of the carriage. Horizontal, 45° angle and vertical positions of the shaft are indexed by a pawl. Other angles can be readily set according to a scale and locked by a small handle. The height of the saw above the table is adjusted by elevating the arm by means of a handwheel and it can be locked in any desired position.

**The right angle position of the arm** in relation to the guide can be accurately set while the table remains in its normal position.

**If high cuts** frequently occur in your workshop, we can supply the machine (against extra charge) with a device, whereby the motor travels on the arm by means of a Gall's chain and a hand lever. This enables steady, uniform cutting and greatly facilitates the operation.

**Ripping** very often used in builders joinery, furniture making etc. is enabled by swinging the motor on the vertical axle of the carriage in order to get the saw parallel with the guide. The motor can be turned either to bring the saw nearer the column or to the outside. The first possibility is employed when cutting narrow parts and the other for wide parts. Wood sections of particularly large width are guided by a second (rear) guide while the front guide is removed. The wood is fed by hand. The bottom part of the saw revolves in the opposite direction to the feed. A safety device for taking up the kick back of the wood is suitably fitted at the rear of the saw guard. It can be raised if not required and secured in this position.

**Bevel-ripping** is performed by tilting the motor. The distance of the saw from the guide (width of material) can be viewed on a scale which is adjustable for length in order to provide the correct width

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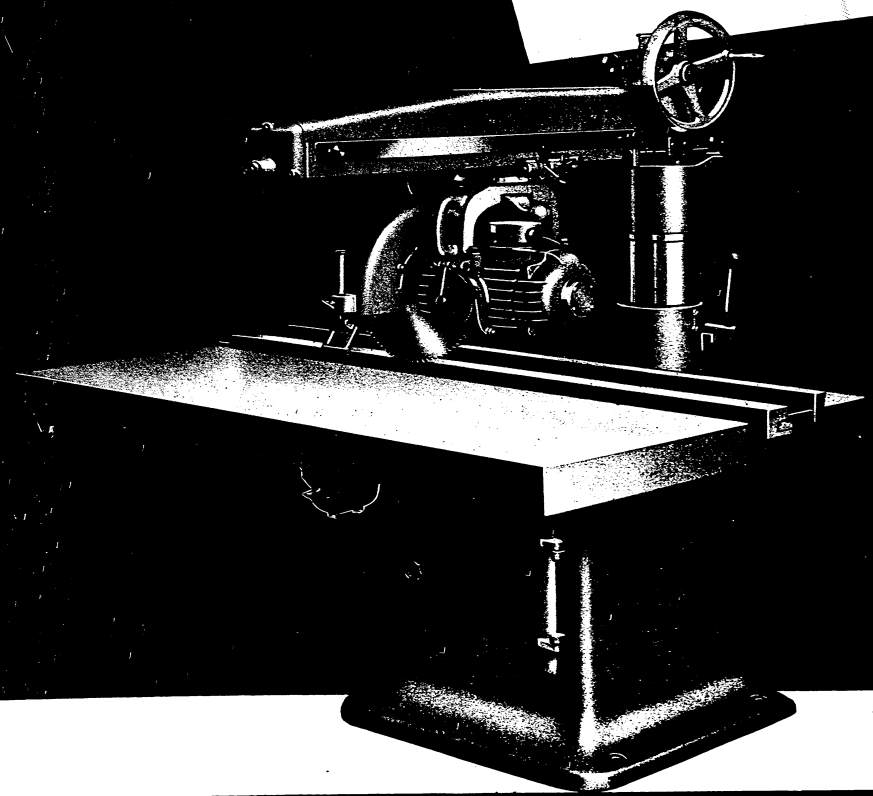
# KRU



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## SPECIFICATIONS

| | | |
|---|---|---|
| Size of table | mm 1000 × 1100 | abt. 40″ × 44″ |
| Height of table | mm 880 | abt. 35″ |
| Speed of shaper spindle | 3000, 4500, 6000 R.P.M. | |
| Vertical motion of shaper spindle | mm 140 | abt. $5\,^1/_2$″ |
| Removable rings | mm diam. 51, 130, 205 | abt. 2, 5, 8″ |
| Throat depth of over arm | mm 400 | abt. $15\,^3/_4$″ |
| Max. height under the over-arm | mm 270 | abt. $10\,^5/_8$″ |
| Tenoning table | mm 340 × 1000 | abt. $13\,^3/_8$″ × 40″ |
| Movement of tenoning arm | mm 880 | abt. $34\,^1/_2$″ |
| Tool holder | mm 30 diam. | $1\,^1/_4$″ |
| Slotted tool holder | mm 48 diam. | abt. $1\,^7/_8$″ diam. |
| | mm slot 8 × 120 | slot $^5/_{16}$″ × $4\,^3/_4$″ |
| Motor | 4 kW, 2880 R.P.M. | 5,5 HP, 2880 R.P.M. |
| Net weight | kg 815 | lbs. 1790 |
| Gross weight | kg 965 | lbs 2025 |
| Gross weight, seaworthy packed | kg 1055 | lbs 2320 |
| Volume of box | $m^3$ 2,2 | cub. ft. 77 |

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distance according to the process of work and the length of the work piece handled. The adjustable fence facilitates shaping up to an angle of 45°.
The table slide is ball bearing equipped, so that it travels quite easily even with the tenoning arrangement being considerably heavy.

### THE ROBUST CLAMPING DEVICE

fixed on the working table consists of two screw spindles with an adjustable cross girt and hold-down shoe. The work piece is perfectly pressed against the table by applying a hand lever fitted on the screw.
The light eccentric clamping device is swivel-suspended on a column fixed on the table and can be adjusted to any position on loosening the bolts.

### THE TOOL HOLDER

of 30 mm diam. is made of special steel, hardened and ground. It can be easily replaced and is fixed into the cone by a nut, thus guaranteeing precise adjustment. The lock-nuts of the shaper spindle allow turning in both directions without danger of loosening the tool. The hardened rings are slightly differenciated and can be applied as spacing collars when tenoning.
The slotted tool holder of 48 mm (abt. 1 $^{7}/_{8}''$) diam. with a slot shank of 8 × 120 mm (abt. $^{5}/_{16}''$ × 4 $^{3}/_{4}''$) is applied for safe fixing of the shaped cutters. The fixing screw is hardened and secured by a lock-nut against loosening.

### THE TRAVELLING CARRIAGE

serves for light tenoning work. The accurate guiding track of the carriage is secured on the table by means of screws and may be adjusted to any position. The little fixing table with the mitering fence and the eccentric clamping device moves easily on the tracks.

### THE ADJUSTABLE FENCE

is suitably designed, thus facilitating quick and precise settings. The guiding plates are replaceable so as to enable to adjust the gap for the respective tool as quickly as possible.
The rear arm together with the guide plate slides in the direction forth out of the cutter.

### THE FIXED FENCE

is similarly designed but has no rear arm.

### THE PRESSURE DEVICE

holds-down the work piece safely and effectively. From above, in front and behind the cutter, the piece is held-down by two spring loaded pulleys, while two flat hold-over springs can be adjusted to any required position from the front.

### APPLICATION

The machine is suitable for any light or heavy shaping and tenoning work.

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# TECHNICAL DESCRIPTION

### THE FRAME

is of box shape, totally enclosed, thus protecting the driving mechanism against dust. The robust construction of the machine guarantees perfect stability, which is maintained even during heavy tenoning jobs and high revolutions of the shaper spindle.

### THE TABLE

is thoroughly ribbed in order to ensure its plain surface and is provided with screw holes for fixing diverse working attachments. There are two removable rings round the shaper spindle.

### THE SHAPER SLIDE

which moves in a prismatic guide at front of the frame ensures proper placement of the spindle due to its massive construction. Its position is secured by two star wheels in the prismatic guide. The slide can be adjusted by a hand wheel and a hoisting screw placed in the centre of gravity. The gearing is encased and equipped with ball bearings, thus facilitating easy hoisting of the spindle.

### THE GROUND STEEL SHAPER SPINDLE

runs in precision ball bearings which prove a successful operation even at high speed. It is grease lubricated and the used up grease which collects under the bearing is removed from time to time. The auxiliary over-arm eccentrically fixed on the table supports the upper end of the spindle in case of heavy shaping operation.

### THE DRIVE

of the shaper spindle is effected from a swivel-suspended motor having a three-stage V-belt pulley. Tightening of the V-belts is automatic, thus guaranteeing smooth operation of the shaper spindle, free from vibrations. The belt pulleys have flying arrangement so as to enable easy changing or replacing the V-belts. The complete electrical outfit mounted on the machine consists of fuses, a throw-over switch for the right and left operation of the shaper spindle and the respective cable connections.

## REGULAR EQUIPMENT

The tenoning arm screwed on the left side of the machine is applied for light as well as heavier tenoning work. The travelling table can be adjusted in the direction of the shaper spindle to the distance of 35 mm (abt. $1^{3}/_{8}''$), so that it is possible to select the best suitable

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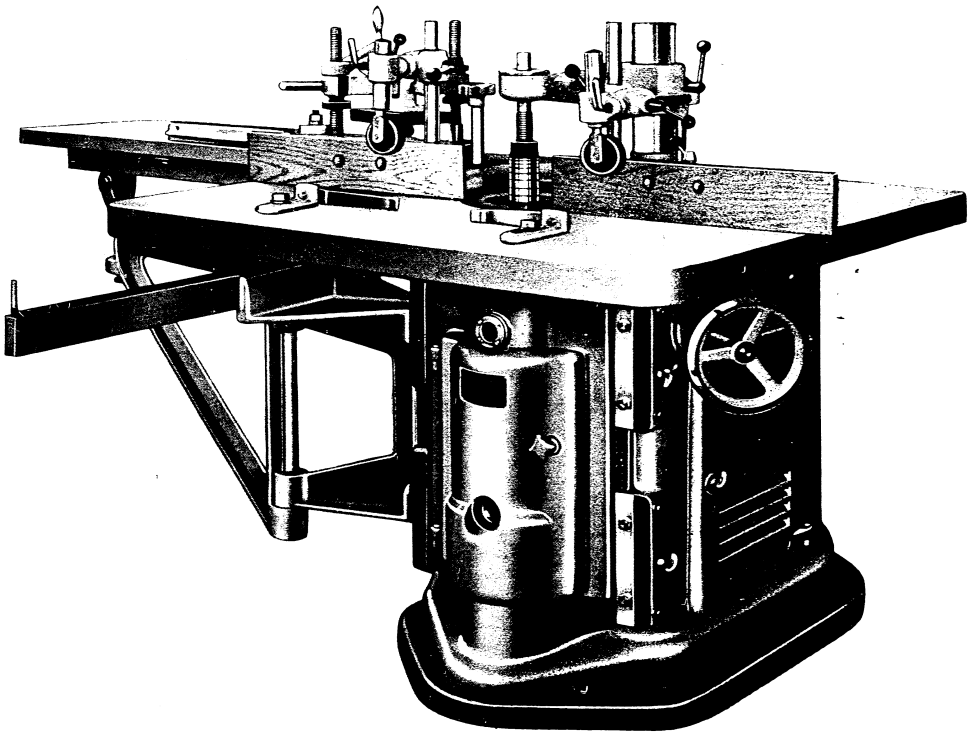

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# SINGLE-SPINDLE SHAPER

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The fence for angular cuts moves in the dovetail slot of the table and can be set to any required angle according to the scale. An adjustable stop enables shortening of its length to suit the cut.

SPECIFICATION:

| | |
|---|---|
| Maximum diameter of saw | 300 mm |
| Bore of saw | 30 mm |
| Maximum depth of cut | 90 mm |
| Maximum swivel of saw | 45 degrees |
| Speed of shaft | 3900 r.p.m. |
| Dimensions of table | 1000 x 700 mm |
| Motor: Power | 3.25 H.p. |
| Speed | 2800 r.p.m. |
| Weight | 365 kg |

WHEN ORDERING SPECIFY VOLTAGE AND FREQUENCY OF POWER SUPPLY!

All dimensions, weights, etc. are approximate only, and illustrations are not binding as to details as we are constantly improving our designs.

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# THE K U A 30 CIRCULAR SAWBENCH

With a view to economy and minimum power consumption this sawbench has been designed for precision cutting with small diameter saws.

The saw is adjustable vertically and can be swivelled up to 45 degrees. The sawbench is ideal for work requiring a small saw gate and minimum power consumption.

D E S C R I P T I O N :

T h e s t a n d is a welded construction the outstanding feature of which is an amply dimensioned base surface providing the required stability.

T h e t a b l e is also powerfully dimensioned, precision machined and well ribbed. It is firmly connected with the stand.

T h e well proportioned s a w s h a f t is manufactured of high quality steel. The precision ball bearings are perfectly sealed against the penetration of dust. The drive is effected by a standard motor through Vee belts.

T h e s a w enables fine vertical adjustment and can be swivelled by means of hand wheels. A scale is provided to enable reading of the amount of swivel. A hand lever enables the saw to be locked in the adjusted position.

T h e e x p a n d i n g w e d g e fitted behind the saw can be adjusted in any direction to suit the saw diameter. Since the wedge is not fastened to the table, but to the headstock /carriage/, it follows the saw and is simultaneously swivelled and vertically adjusted.

T h e g u a r d with which the sawbench is provided in accordance with the prevailing regulations eliminates the possibility of injury to the operator.

T h e f e n c e f o r l o n g i t u d i n a l c u t s is adjustable on Vee slides according to a precision scale graduated in millimetres. The fence can easily be removed when required.

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This machine is the best and most practical of all circular cut-off saws either of pendulum or straight line type. Compared with saws cutting in an arc, as it is the case with suspended swing cut-off saws, this machine possesses the advantage of straight line motion and consequently the possibility of complete utilization of the saw blade over the entire cutting height. As the saw is arranged above the table surface, it has the same position for any thickness of wood pieces to be cut as well as the most convenient working conditions. The elements guide the saw forward into cut swivel in arcs which are composed into a resultant straight line motion of the saw blade, parallel to the table. All hinge-joints of the pendulums and levers are equipped with precision ball bearings. Thereby quite an easy and accurate transverse motion of the saw blade is ensured. The machine frame has a large base. Its upper part forms a throat of the cylindrical guide in which a strong column carrying the lower pendulums is adjustable to the required height. The head of the machine rests on these four lower pendulums. The actual saw pendulum is suspended in this head and carries a special three-phase motor of entirely enclosed construction. The motor shaft serves, at the same time, for fixing the saw blade.

On the back reversing point of the pendulum there is a safety stopping device firmly connecting the saw pendulum with the machine head, thus preventing the pendulum from swinging forward by itself. This connection can be released only after pressing down the handle. Two of the lower pendulums are elongated in the downward direction and carry counterweights balancing the upper part of the machine. The direction of rotation of the circular saw ensures that the wood pieces are automatically forced against the fence by the cut and the pendulum itself is forced to move forward. It is not necessary for the operator to hold the wood, nor to pull the pendulum into cut with much effort. Also the view of the working saw blade is perfectly open to inspection from above. The saw is fitted with a large removable safety guard.

The three-phase electric motor of specially elongated construction is entirely enclosed, with jacket cooling. The stator body is amply fitted with cooling ribs. The motor bearings are strongly dimensioned with regard to the heavy duty of the machine. Normally we supply the machines with three-phase electric motors for a working voltage of 380/220 V, 50 cycles. If you have another working voltage in your network, this should be stated in your order.

The wooden table is not supplied with the machine. Normally the customer has it made on the spot according to a drawing sent by us. On special request, however, we can supply an iron table (5 m long) fitted with rotatable rolls, placed in ball bearings, so that the feeding of even heavy wood pieces is effected very easily.

Three required lengths of the wood pieces can be adjusted on a metric scale 2.5 m long by means of tiltable longitudinal stops, by means of which the stock of any adjusted length can be cut successively without readjustment.

## DIMENSIONS AND TECHNICAL DATA:

| Type | KPK 40 | KPK 50 |
|---|---|---|
| Saw blade diameter | 400 mm | 500 mm |
| Max. depth of cut | 90 mm | 130 mm |
| Max. cross movement | 500 mm | 750 mm |
| Three-phase electric motor 2800 r. p. m. | 3 kW | 5.5 kW |
| Net weight | 450 kg | 680 kg |
| Weight incl. railway packing | 545 kg | 800 kg |
| Weight incl. seaworthy packing | 620 kg | 910 kg |
| Dimensions | 1320×870×1520 mm | 1600×1030×1630 mm |
| Cubature | 1,75 $m^3$ | 2,65 $m^3$ |

## ACCESSORIES:

1 circular saw blade 404/500, mm diam.,
1 throw-over switch with fuses and complete electrical outfit on the machine,
1 set of spanners necessary for the attendance of the machine

The above data cover the machine as designed at the time of the printing of this prospectus. Future improvements and alterations of design are therefore reserved.

**MOTOKOV**

Foreign Trade Corporation for Import and Export of Vehicles and Light Engineering Products, Praha VII, třída Dukelských hrdinů 47, Czechoslovakia

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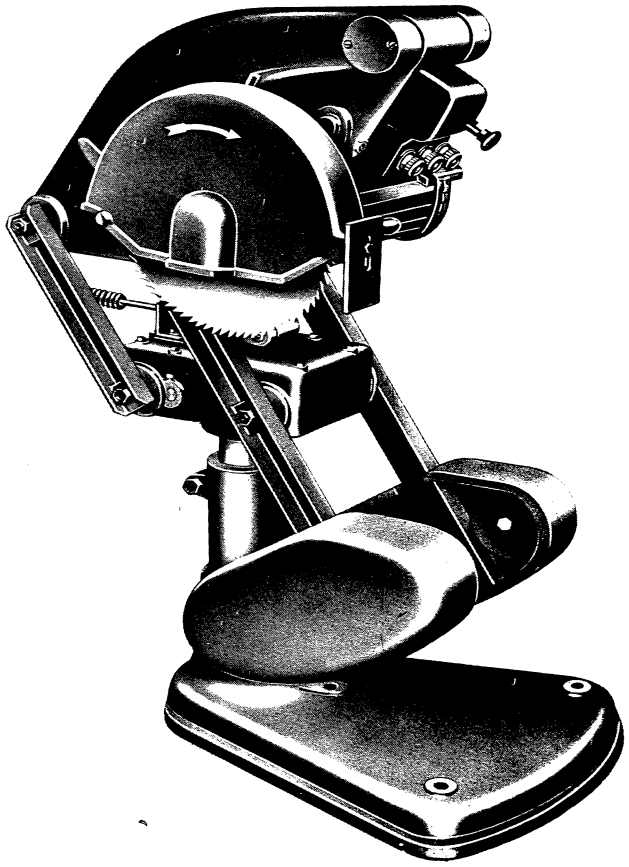
# KPK

40,50



**ELECTRIC STRAIGHT LINE CUT-OFF SAWS**

**TYPE 40 KPK 50**

MOTOKOV

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## TECHNICKÝ POPIS:

1. **Hoblovací válec** je ze slitin lehkého kovu o velké pevnosti, opatřen dvěma hoblovacími noži, upevněnými celkem 10 šrouby. Je dynamicky vyvážen, unášen třením po obou stranách a uložen ve výkyvných kuličkových ložiskách.
2. **Pevná vodící deska** ručního hoblíku RH 250 je spojená šrouby s oběma bočnicemi a krytem elektromotoru. Na nálitku pevné desky je upevněna rukojeť, která je druhým koncem přišroubována k objímce elektromotoru.
3. **Posuvná deska** je vedena v bočnicích po obou stranách a řídí se jí hloubka hoblované třísky. Nastavení provádí se dvěma výstředníkovými čepy, jež jsou na obou koncích rukojeti. Rukojeť je opatřena dřevěným držadlem, vhodně upraveným pro snadné natočení výstředníkových čepů. Třísku možno staviti i při práci. Nastavení třísky lze zajistiti dvěma šrouby v bočnicích.
4. **Převodová skříň** je umístěna v pravé bočnici a obstarává náhon hoblovacího válce od elektromotoru. V převodové skříni jsou 3 ozubená kola z ušlechtilé konstrukční oceli. Prostřední z nich je vyrobeno ze specielního materiálu s ohledem na nehlučný chod hoblíku při práci. Kola mají šroubové ozubení a jsou uložena v kuličkových ložiskách.
5. **Elektromotor** pro střídavý třífázový proud 220/380 V o výkonu 0,75 Kw je úplně uzavřen mezi bočnicemi a objímkou statoru. Hřídel motoru je uložena ve třech kuličkových ložiskách.
6. **Ve zvláštním příslušenství** je dodáváno pravítko, sloužící k hoblování do pravého úhlu a ochranný kryt na nožový válec.

Celá konstrukce ručního hoblíku RH 250 je s ohledem na váhu zhotovena ze slitin lehkého kovu. Všechny části ručního hoblíku RH 250 tvoří vzhledně vyřešený celek.

## NORMÁLNÍ PŘÍSLUŠENSTVÍ:

1 nástrčkový klíč pro utahování upínacích šroubů hoblovacích nožů,
1 vyrážecí kolík,
2 náhradní nože,
kabel v délce 15 m (nepředepíše-li si zákazník jinak) s nástrčkou a zástrčkou.

## ZVLÁŠTNÍ PŘÍSLUŠENSTVÍ: (dodáváme proti vyúčtování)

1 pravítko,
1 ochranný kryt hoblovacího válce a prodloužení kabelu (dle přání zákazníka).

## TECHNICKÉ ÚDAJE:

| | | |
|---|---|---|
| **Hoblovací válec:** | hoblovací délka | mm 250 |
| | průměr | mm 80 |
| | počet obrátek | obr/min 4050 |
| | počet hoblovacích nožů | ks 2 |
| | délka nožů | mm 250 |
| | šíře nožů | mm 35 |
| | tloušťka | mm 3 |
| | počet upínacích šroubů | 2 × 5 |
| | Nastavitelnost třísky | od 0 mm — 3 mm |
| **Elektromotor:** | výkon | Kw 0,75 |
| | | ks 1,— |
| | střídavý proud třífázový 220/380 V | |
| **Vnější rozměry:** | délka | mm 450 |
| | šíře | mm 400 |
| | výška | mm 160 |
| **Váha:** | celkem | kg 23 |

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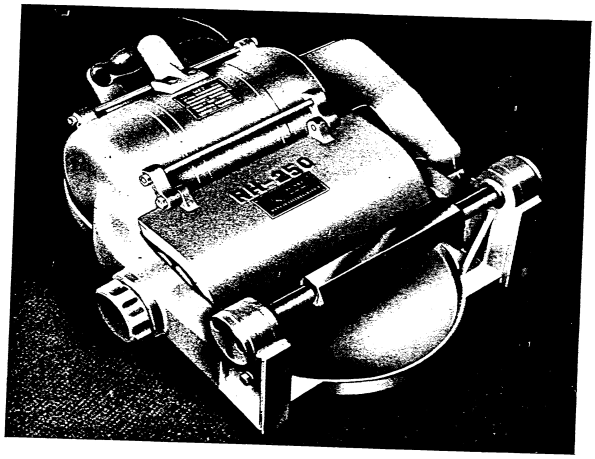
# PILANA NÁRODNÍ PODNIK

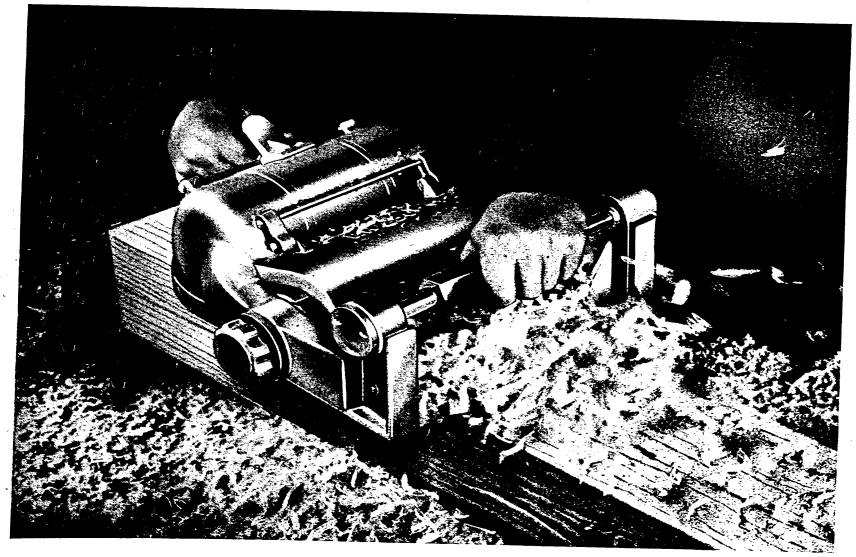
## Ruční hoblík RH 250 s elektrickým pohonem

Mezi ručními přenosnými dřevoobráběcími přístroji zaujímá významné místo ruční hoblík RH 250 s elektrickým pohonem.

Jako ostatní dřevoobráběcí strojky nachází náš ruční hoblík uplatnění v každé dílně, kde je opracováváno dřevo. Svým výkonem a účelností je oblíben u všech, kdož s ním pracují. Mimo stolařské dílny, továrny a různé dřevoobráběcí závody, dostává se ručnímu hoblíku RH 250 uplatnění i v tesárnách, na stavbách a při montážních pracích, neboť dostatečnou hoblovací šíří (250 mm) postačí opracovati rychle a bez námahy i ty největší plochy trámů a prken.




Zapojení na střídavý třífázový proud 220/380 V dává hoblíku RH 250 velké možnosti uplatnění a plného využití. Je to dokonalý výrobek, který šetří nejen čas, ale i peníze.



Zhotovení všech součástí z lehkého kovu sleduje snížení váhy na nejmenší možnou míru, což se u našeho hoblíku plně zdařilo. Veškeré převodové části, stejně jako otáčející se hoblovací válec jsou bezpečně a dokonale zakryty, takže možnost úrazu je zcela vyloučena.

V menších provozovnách či při montážních pracích a na stavbách dovede náš hoblík nahraditi hoblovací stroj. Učiní se tak pouhým převrácením hoblíku a zajištěním proti pohybu, jež by mohl nastati do stran.

Gusek, národní podnik v Kroměříži

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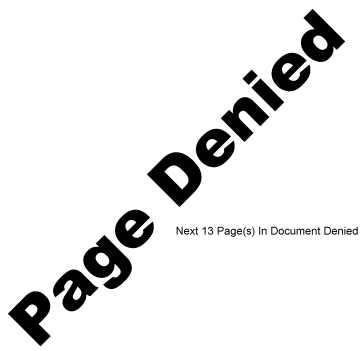
50X1-HUM

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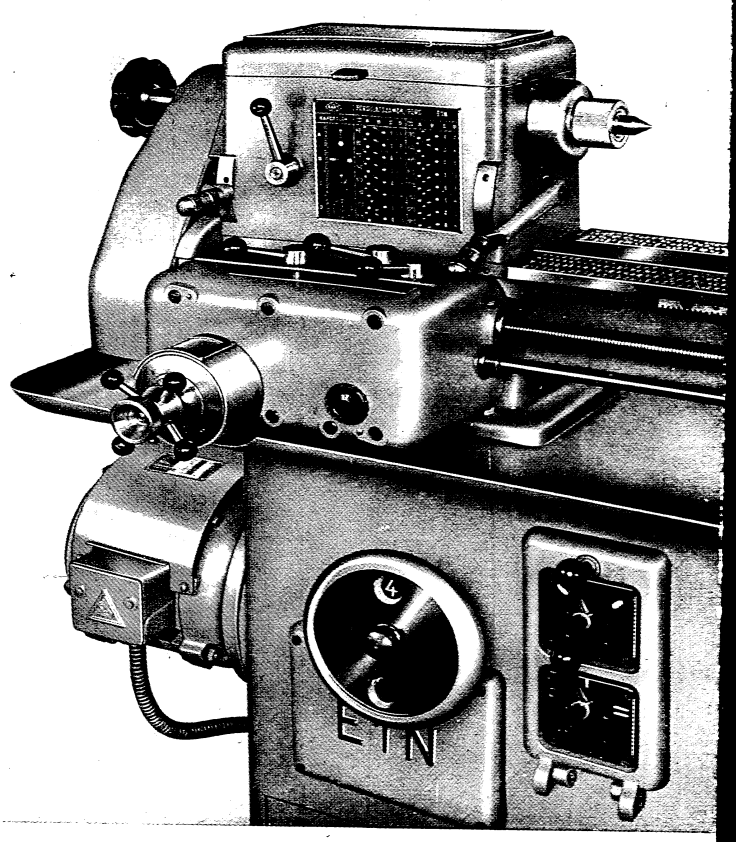
## DESCRIPTION OF MAIN PARTS



BED Of high quality material, diagonally ribbed for maximum stiffness, with broad slide-ways. Vee-guides for saddle and tailstock. The bed has been precisely machined in accordance with the accuracy of the machine.

MOTOR Flange-mounted upon the bed, the motor supplies two speeds. To maintain Vee-rope tension it can be adjusted on bed casting. Drive is transmitted to lower gearbox over an elastic clutch, eliminating auto-vibrations of the motor.

LOWER GEARBOX Fully enclosed. Hardened and ground gears are used throughout. Special alloy steel shafts, all running in roller bearings. A special annular seal compressed by a spring (Simmer-Ring) prevents oil leakage through the outgoing shaft.

GEARBOX Fitted with oil gauge, oil fill hole and oil outlet. Gives 4 speeds in connection with the lower gearbox; these are doubled by the two-speed motor.

HEADSTOCK A load-free pulley transmits the drive directly to the spindle or, alternately, over a train of helical gears, giving two further speed-steps which double those of the gearbox. As a result a range of 16 speeds is available.

SPINDLE The spindle is case-hardened and ground, and has been carefully balanced. It runs in sleeve-type, easily adjustable front and back bearings with tapered lead-bronze bushes.

CHANGE GEARBOX 9 change wheels, 2 direct wheels and the necessary tumblers are supplied with the machine.

FEED GEARBOX The Norton-type feed gearbox is totally enclosed, with its gears running in oil. Oil fill hole, oil outlet and oil gauge have been provided. The gears are made of refined material, shafts subject to greater stress have been hardened and ground. A 24-steep feed range is supplied to the leadscrew as well as to the feed shaft by means of its 3 speeds and Norton-type cone of 8 gears. Moreover, the shifting of lever gives special gear ratios to either the leasdcrew or the feed shaft. Special leads can be obtained, therefore, by using the appropriate change wheels. By using the change wheels supplied with the machine, the above-mentioned 24 feed steps give a range of 122 different threads and 160 longitudinal and cross feeds. Feed shifting is done by means of a special drum-type dial which also indicates the feed or lead selected. The leadscrew, having a 3 mm pitch, has been machined with special accuracy. A safety stop is provided on the feed shaft, disengaging the latter when run up against.

APRON The semi-closed apron is made of high quality iron casting. Longitudinal and cross feeds as well as leadscrew and feed shaft shifts are interlocked. Centralised apron lubrication. The oil well is filled through hole (see sketch).

CROSS SLIDE The cross slide has been supplied with sliding surfaces of ample dimensions and with a dovetail of ample width. It carries the upper slide and the four-way turret. The turret is locked in each of its four positions by a spring-loaded plunger.

TAILSTOCK The adjustable tailstock spindle bears on the full length of the casting in any position. Drilling depth adjustment can be done by means of an appropriate scale calibrated in millimetres. The usual clamps and cross adjustment have been provided.

EQUIPMENT:

Dog Plate * Two Centres * Draw-in Rod * Steady Rest * Follow Rest * Spindle Protection Sleeve * Nine Change Gears * Set of Wrenches * Two Charts * Motor, 1.3/2 HP, 700/1400/RPM, 380 Volts, 3 phases, 50 cycles, A. C. * Pole Change Switch * Reverse Switch * Complete Electrical Equipment * 245 mm dia. Faceplate * 10 mm dia. Collet * Lamp, without Bulb * Twenty Collets * 130 mm dia. 3-jaw Chuck * Blueprint Holder

TECHNICAL DATA:

| | | |
|---|---|---|
| Centre height | 125 mm | 5″ |
| Centre distance | 500 mm | 20″ |
| Width of bed | 167 mm | 6 5/8″ |
| Length of bed | 1140 mm | 45″ |
| Spindle bore | 20 mm | 3/4″ |
| Pitch of lead screw | 3 mm | 1/8″ |
| Bore of tailstock, Morse | 2 | |
| Number of speeds | 16 | |
| Range of speeds | 60—1860 Rev/min. | |
| Longitudinal feed range | 0.05—2.6 mm per rev. | |
| Crossfeed | 1/5.755 of longitudinal feed | |
| Shipping dimensions | 1500×1500×760 mm | 60″×60″×30″ |
| Motor power rating | 1.3/2 HP | |
| Net weight | 560 kg | 1232 lbs |

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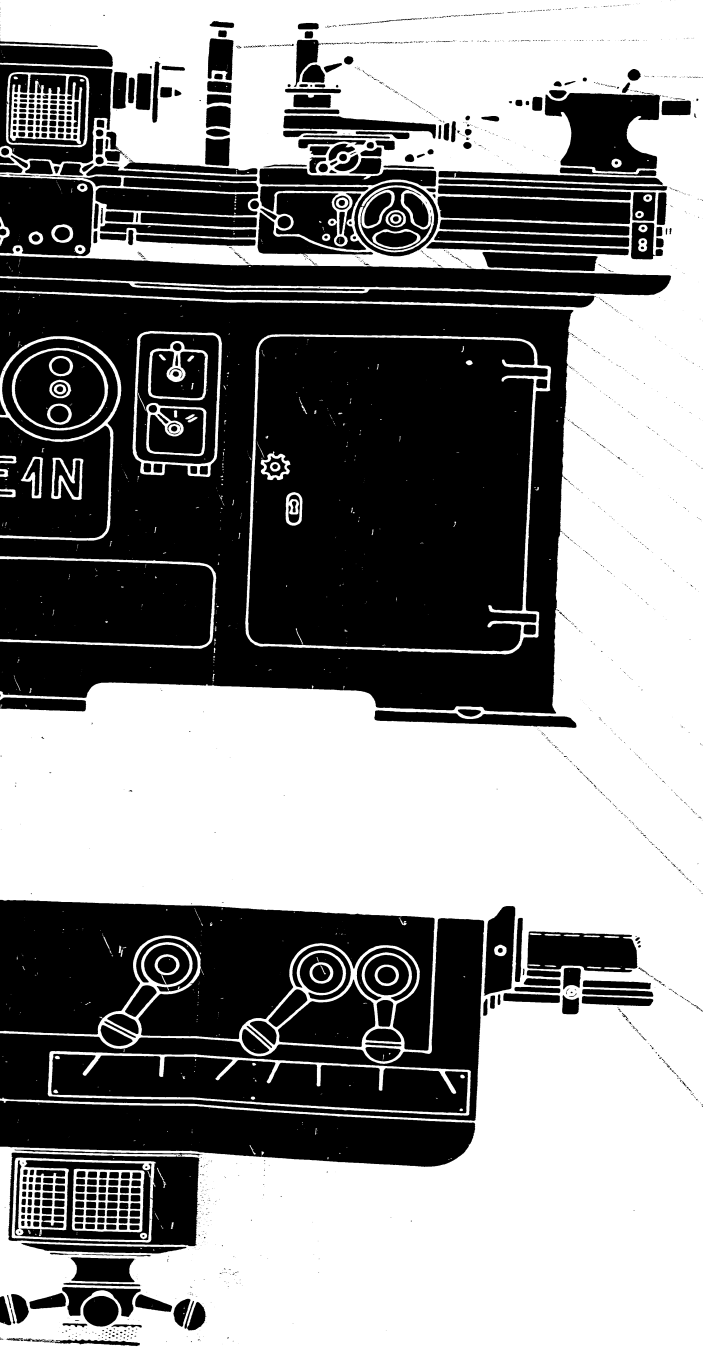

Travelling Stay

Stationary Stay

Tailstock Clamp

Tailstock Spindle Sleeve Clamp

Tailstock Spindle Adjustment Handle

Tailstock Cross Adjustment Screw

Top Slide Feed Handle

Four-way Turret Locking Lever

Apron Oil Hole

Saddle Lock Handle

Saddle Traverse Handwheel

Cross Slide Feed Handle

Longitudinal and Cross Feed Shift Lever

Leadscrew Reverse Handle

Leadscrew and Feed Shaft Shift Lever

Longitudinal Feed Safety Stop

Tool Cabinet with Lock

Feed Gearbox Oil Gauge

Leadscrew

Feed Shaft

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Hinged Headstock Cover

Gear Change Lever

Collet Chuck Draw-in Handwheel

Leadscrew and Feed Shaft Reverse Lever

Feed Gearbox Metric & Whitworth Thread Shift Lever

Feed Shift Lever

Change Gearbox Lid

Leadscrew and Feed Shaft Shift Lever

Feed Gearbox Handle

Feed Gearbox Lever Clamp

Feed Gearbox Oil Outlet Plug

Motor

Belt Tension Adjustment Screw

Lower Gearbox Central Control Handwheel

Reverse Switch

Change Motor Speed Switch

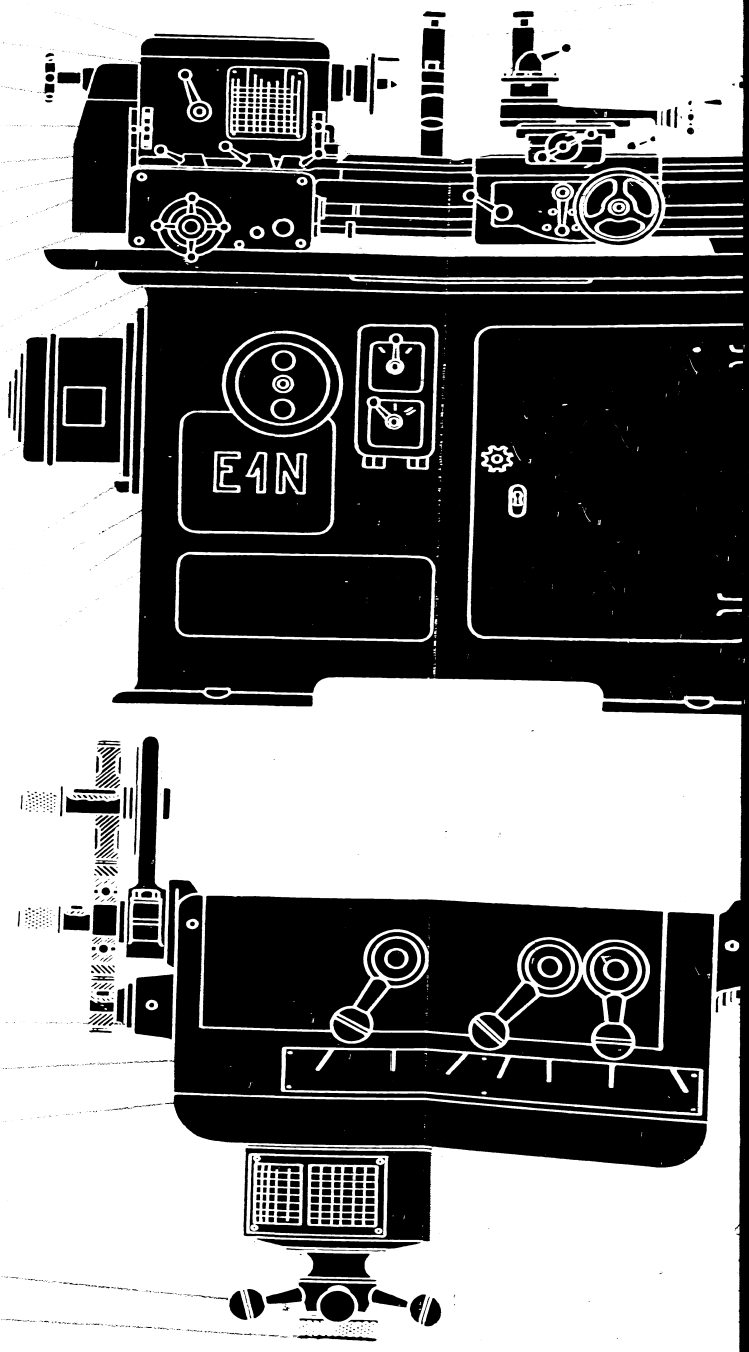
Feed Gearbox Metric & Whitworth Thread Shift Lever

Feed Shift Lever

Leadscrew and Feed Shaft Shift Lever

Feed Gearbox Handle

Feed Gearbox Lever Clamp

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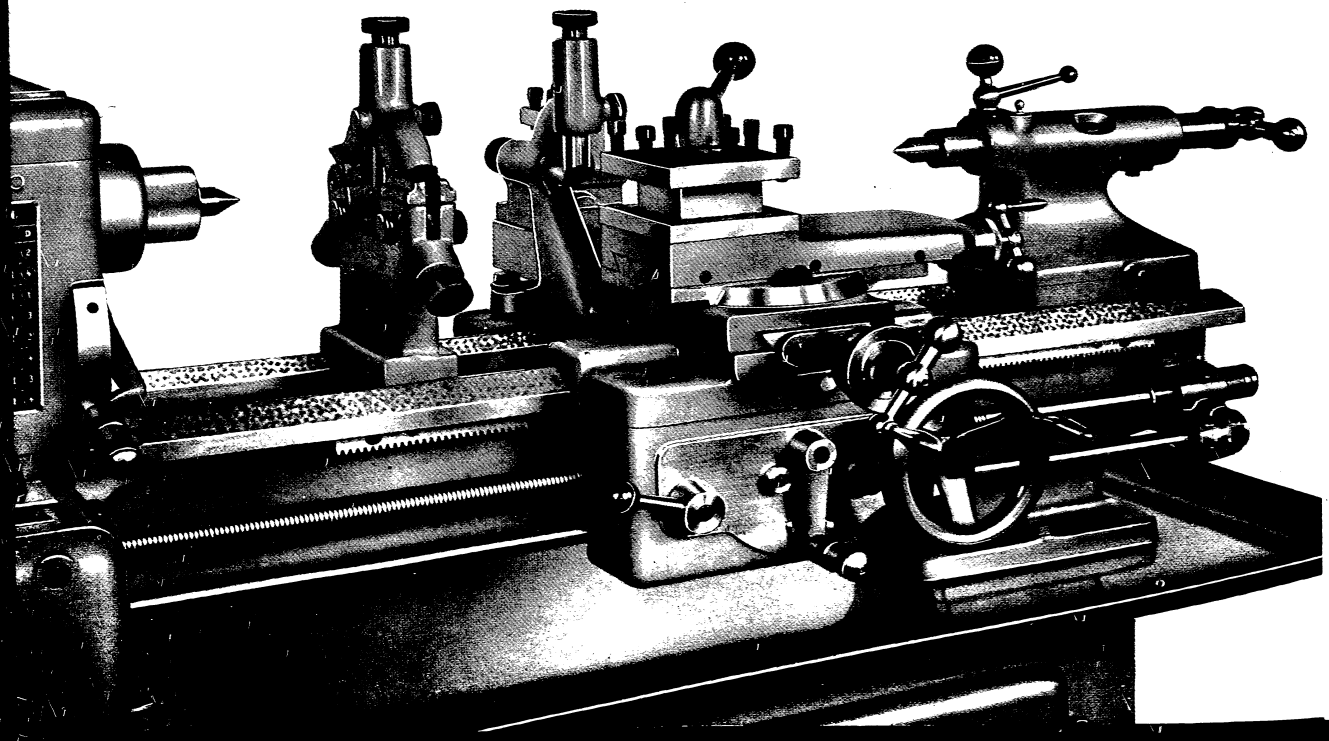
# TOOLMAKERS LATHE

## ADVANTAGES

Being a precision Toolmakers Lathe, operations demanding a high grade of accuracy can be performed on the machine. A speed range of 60 to 1860 RPM gives the lathe great flexibility and, in consequence, adaptability to a large variety of turning operations. A broad range of materials can be machined by the lathe using carbide-tipped or high speed steel tools. Thread-cutting operations are carried out by means of a precision feed gear box controlled by a central revolving drum. A wide range of Metric, Whitworth and Module threads can be cut. Longitudinal feeds can also be adjusted within broad limits to meet requirements of operation. The motor has two speeds, and can be rotated in either direction. Speed change as well as reverse are controlled by simple lever switches. Special quality castings increase the durability of the machine as well as its resistance to wear. The gears used in places of greater stress have been hardened and ground. This ensures reliability of operation and silent running. The main drive is transmitted over Vee-ropes preventing spindle vibrations. Lead-bronze, adjustable, sleeve-type bearings are used with the spindle. These bearings adjust themselves perfectly to all spindle speeds. Extra equipment gives the machine a wider range of adaptability to all kinds of turning operations.



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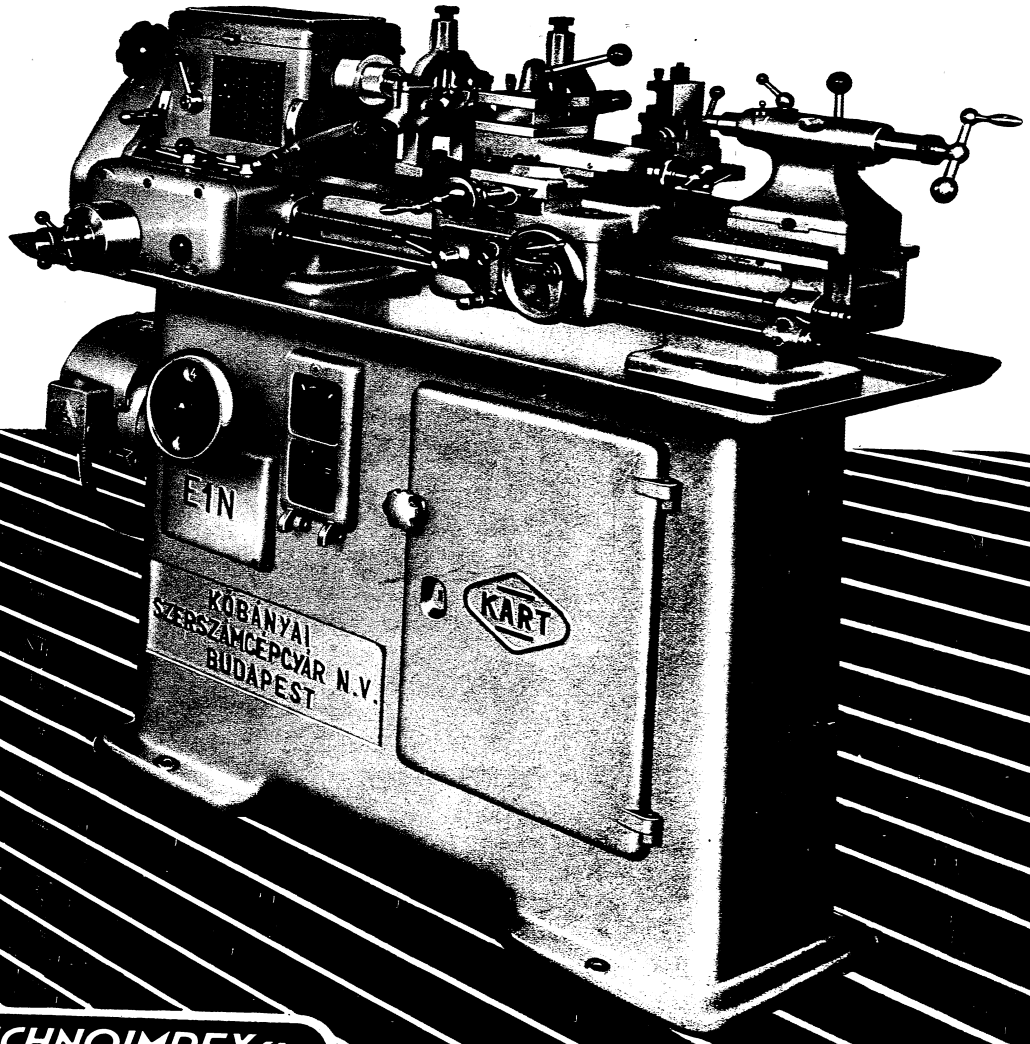
# TOOLMAKERS LATHE

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# PRECISION LATHES EU 175 AND 215

## SPECIFICATIONS

| | Metric | | English | |
|---|---|---|---|---|
| | EU 175 | EU 215 | EU 175 | EU 215 |
| Height of centres | 159 | 199 | $6\frac{3}{8}''$ | $7\frac{7}{8}''$ |
| Takes between centres | 1000—1500 | | 3'4''—6 | |
| Swing over bed | 330 | 435 | $13\frac{1}{8}''$ | $17\frac{1}{4}''$ |
| Swing over saddle | 180 | 245 | $7\frac{1}{8}''$ | $9\frac{3}{4}''$ |
| Pitch over leadscrew | 6 mm | | 6 mm | |
| Spindle taper, Morse No. | No. 5 | | No. 5 | |
| Tailstock centre, Morse No. | 3 | | 3 | |
| Spindle speeds, number | 18 | | 18 | |
| Spindle speeds range, RPM | 20.5 to 1600 | | 20.5 to 1600 | |
| Feeds, number | 30 | | 30 | |
| Motor, HP | 7.5 | | 7.5 | |
| Weight | 2300-2400 kg | 2500-2600 kg | 5060-5280 lbs | 5500-5700 lbs |

EQUIPMENT: 7.5 HP motor operative on 380 volts, 50 cycles, 3-phase a—c, complete with starter; coolant pump built integrally with motor, complete with piping; face plate with four jaws; dog plate; chuck plate; steady rest; follow rest; adjustable stop; cross slide stop equipment; spindle sleeve; 2 centres; oil can; grease gun; set of wrenches; work light.

EXTRA: Taper turning attachment, stop roll for sliding operations, 3-jaw chuck.

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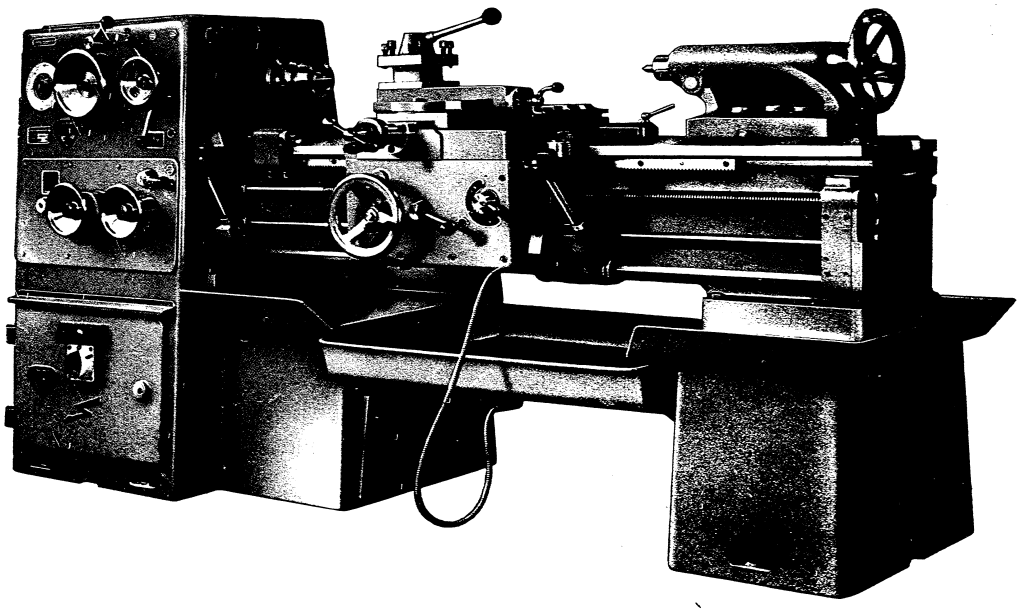
# PRECISION LATHES *EU*

For high-performance roughing and fine finishing jobs. Modern design, composed of standard units. Heavy, amply ribbed bed cast for holding a taper turning and a duplicating attachment. Rigid headstock casting with a small number of easily operated controls and surface speed calculator at the front. Spindle provided with a through bore, with direct Vee-belt drive for the top speed range and speed pre-selector device. Rugged saddle and slides, with square toolholder. Sliding, surfacing and thread cutting operations selected by a single lever provides foolproof operation. Totally enclosed, flush-mounted Norton-type feed gearbox of novel design easily operated by two handwheels. Thread cutting and feed dial tables ensure important reductions in down time. Serial production is rendered possible by high-accuracy stop roll. Unusually rugged tailstock with ribs inclining forwards.



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# ENGINE LATHES MVE 280 M

## SPECIFICATION

| | Metric | English |
|---|---|---|
| Height of centres above flat ..... | 280 mm | 11" |
| Max. swing (diameter) in gap ..... | 750 mm | 29 1/2" |
| Width of gap in front of faceplate.... | 300 mm | 12" |
| Swing over bed ..... | 590 mm | 22 1/4" |
| Swing over carriage ..... | 390 mm | 15 11/32" |
| Distances between centres .. | 1500—2000—3000 mm | 59"—78"—118" |
| Width of bed ..... | 490 mm | 19 5/16" |
| Leadscrew pitch ..... | 1/2" | 1/2" |
| Spindle taper, Morse No. ..... | 5 | 5 |
| Speeds, number ..... | 18 | 18 |
| Speeds, range ..... | 19 to 950 RPM | 19 to 950 RPM |
| Number of feeds ..... | 26 | 26 |
| Motor rating ..... | 15 HP | 15 HP |
| Weight ..... | 3750—3900—4300 kg | 8250—8580—9460 lbs |

STANDARD EQUIPMENT: 15 HP motor operative on 380-volt, 3-phase, 50-cycle a-c; coolant pump built in one with motor, complete with piping; control equipment, complete; four-jaw faceplate; dogplate; set of wrenches; work light; oil can; grease gun.

EQUIPMENT SUPPLIED AT EXTRA COST: Taper turning attachment; three-jaw chuck; live centre; drill chuck.

Rights reserved to change dimensions, weight and design.

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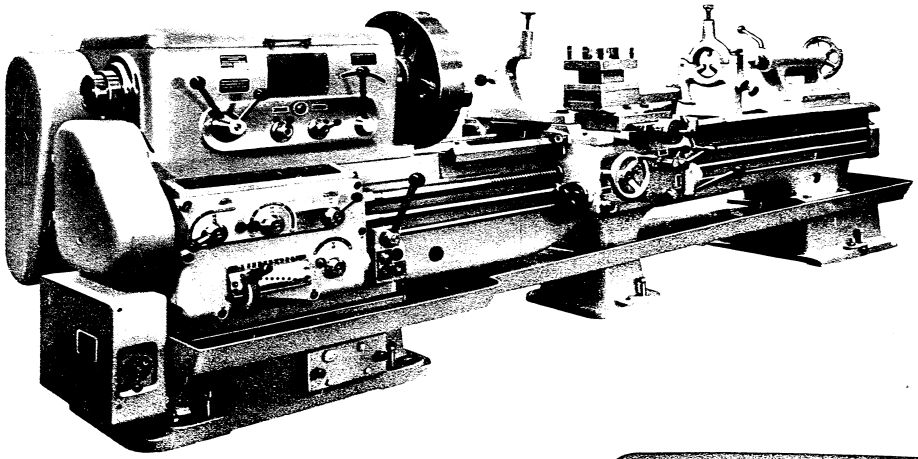
# ENGINE LATHES MVE 280 M

Heavy-duty machines, equally suitable for roughing and finishing operations. The bed, equipped with removable gap bridge, is a specially wear-resistant casting. The rugged headstock does not transmit vibrations even under the heaviest loads. The spindle is provided with a through bore and is mounted at the front in double-row and at the rear in single-row high-precision cylindrical roller bearings. Thrust in either direction is taken by special thrust ball bearings. Smooth starting of the spindle in either sense is ensured by a multi-plate clutch. Carriage and slides are carefully designed and receive ample lubrication. The tool slide is provided with a square toolpost. Feed is tripped by a safety clutch in case of overloads. A mechanical interlock prevents the simultaneous engagement of sliding and surfacing feed. The feed gearbox is of the Norton type. Four and sixteen fold coarse thread pitches may be cut. Leadscrew and feed rod can be alternatively engaged. Means for turning to stops are provided. The tailstock can be clamped easily it is laterally adjustable for turning small angle tapers.



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# UNIVERSAL MILLING MACHINE ME 1000

## SPECIFICATIONS

| | Metric | English |
|---|---|---|
| Table, working surface | 200×1000 | 8"×40" |
| Table, number of Tee slots | 3 | |
| Table, longitudinal travel, hand | 640 | 25 1/4" |
| Table, power | 630 | 24 7/8" |
| Table, transverse travel | 220 | 8 3/4" |
| Table, vertical travel | 300 | 12" |
| Table, swivel in either direction | 45° | |
| Spindle, taper, normal | Morse No 4, or ISA No 44 | |
| Spindle on request | Metric 32 | |
| Spindle, speeds, number | 12 | |
| Spindle, range, normal, RPM | 63 to 2800 | |
| Spindle on request, RPM | 90 to 4000 | |
| Distance, centreline of spindle to table, max. | 325 | 13" |
| Distance, min. distance | 25 | 1" |
| Centreline of spindle to bottom of arbor support | 110 | 4 3/8" |
| Number of feeds | 13 | |
| Spindle motor, HP | 3.25 | |
| Feed motor, HP | 0,7 | |
| Weight | 890 kg | 1958 lbs |

## EQUIPMENT

STANDARD: 3.25 HP motor, 0.7 HP motor, both operative on 380 volts, 50 cycles, 3-phase a-c; coolant pump built integrally with motor, complete with piping; electrical control equipment; oil pump; 27 mm (1 1/16") dia arbor; set of wrenches; work light.

EXTRA: Universal dividing head, complete; 250 mm (10") dia circular table, hand-operated, with 360 scale; vertical milling attachment; universal vertical milling attachment (swivelable); vice; rack dividing head.

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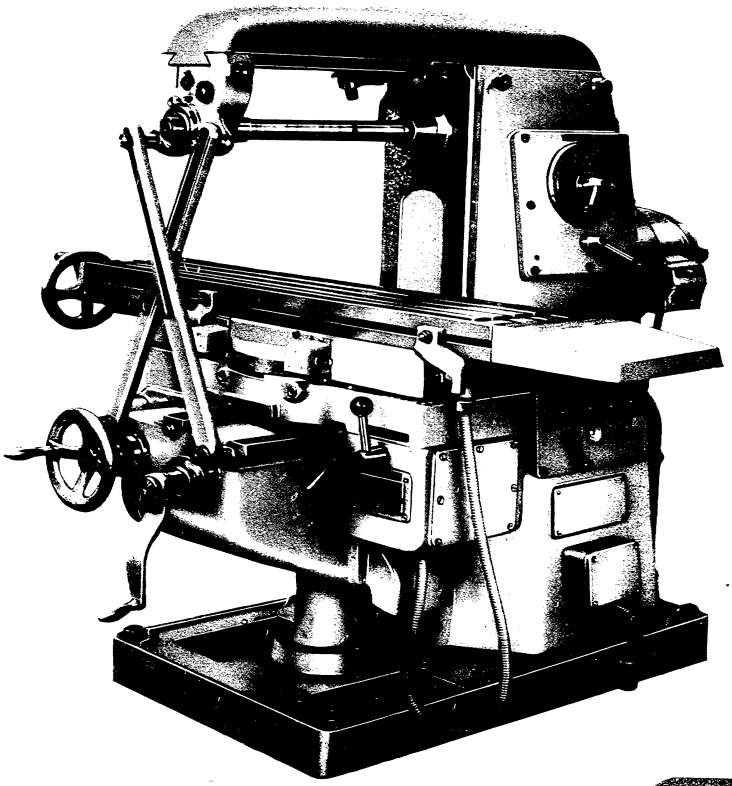
# UNIVERSAL MILLING MACHINE ME1000

For individual jobs as well as for production work, for machining large tools or smaller machine parts. Rugged frame with smooth lines and strong ribs inside. Exceptionally long table having broad ways and supported efficiently at extreme positions. Self-contained feed mechanism, also providing rapid traverse, powered by a separate motor, is built into the knee. Automatic feed cycles set by adjustable stops. Spindle drive provided with 12-speed gearbox. High speed range for machining nonferrous metals available on special request. Speed and feed gearboxes provided with separate lubrication systems. Broad range of attachments for circular and spiral milling as well as for milling racks, gears, etc.



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# TYPE RD 47 TURRET LATHE

## SPECIFICATIONS:

| | | |
|---|---|---|
| Max. diameter of bar work, mm | 45 | $1\frac{3}{4}''$ |
| Max. diameter of chucking work, mm | 140 to 230 | $5\frac{1}{8}''$ to $9\frac{1}{16}''$ |
| Turret, number of tool holes | 16 | 16 |
| Turret, travel of slide, mm | 460 | $18\frac{1}{4}''$ |
| Spindle speed range, RPM | 22 to 2000 | 22 to 2000 |
| Number of feeds | 9 | 9 |
| Motor, kW | 3.5—6—8 | 3.5—6—8 |
| Weight, kg | 2450 | 5390 lbs |

## EQUIPMENT:

STANDARD: 3.5—6—8 kW, three-speed, pole-changing motor, operative on 380 volts, 50 cycles, 3-phase a—c; coolant pump built integrally with motor, complete with piping; electrical control equipment, complete; oil pump; set of wrenches; oil can; work light.

EXTRA: Air-operated chuck with one collet as sample; air-operated stock feed with one finger as sample; air compressor set; thread cutting attachment with one leader as sample; automatic tripping device for thread cutting attachment; grooving attachment; knurling attachment; longitudinal duplicating attachment; transverse duplicating attachment; longitudinal stop roll; symmetrical transverse stop; right hand transverse stop; left hand transverse stop; transverse master stop; turret without holes.

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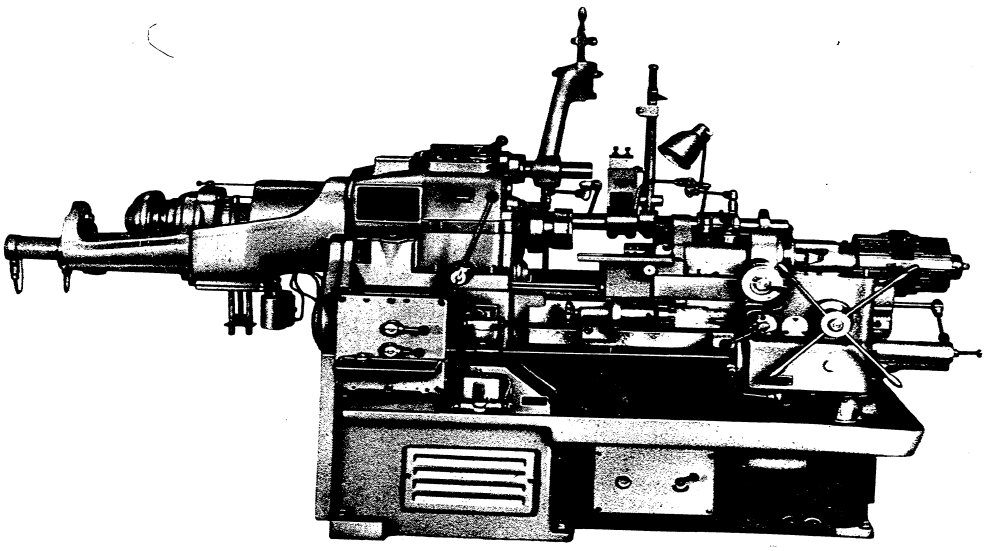
# TURRET LATHE RD 47

Primarily for bar work, can also be used for chucking work with the appropriate equipment. Rugged bed of special design which prevents the accumulation of chips. Enclosed headstock. Spindle with a 47 mm dia through bore. Seven spindle speed ranges, each incorporating ten speeds so that 70 speeds are available. This high number of speeds ensures the choice of the most adequate rate for cutting steel as well as nonferrous metals. The drum-type turret takes sixteen tools. Turret is accurately indexed. Sliding and surfacing feeds are selected by the same lever. Automatic tripping of power feeds within 0.02 mm. Air-operated power chuck and bar feed. The high number of speeds is obtained by a three-speed pole-changing motor and pick-off gears.



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# UNIVERSAL MILLING MACHINE UF 22

## SPECIFICATION

| | | |
|---|---|---|
| Table, overall surface | 1500×385 | mm |
| Table, working surface | 1280×280 | mm |
| Table, longitudinal travel | 800 | mm |
| Table, transverse travel | 210/280 | mm |
| Table, vertical travel | 400 | mm |
| Spindle, distance between centre-line and table surface ..... max. | 480 | mm |
| ..... min. | 80 | mm |
| Spindle, distance to bottom of overarm | 190 | mm |
| Spindle, speed range | 19 to 1500 | RPM |
| Number of feeds | 18 | |
| Main motor rating | 12 | HP |
| Traverse motor rating | 2.5 | HP |
| Weight | 3810 | kg |

STANDARD EQUIPMENT: 12 HP motor, 2.5 HP motor, 0.14 HP motor, all operative on 380-volt, 3-phase, 50-cycle a. c.; coolant pump built integrally with motor, complete with piping; control equipment; set of wrenches; work light.

EXTRAS: Universal dividing head for spiral milling, with separate drive; vertical milling attachment; slotting attachment; 450 mm dia. circular table for hand drive, with 360° graduation; arbors with 22, 27, 32, and 50 mm dia.

Rights reserved to change dimensions, weight and design.

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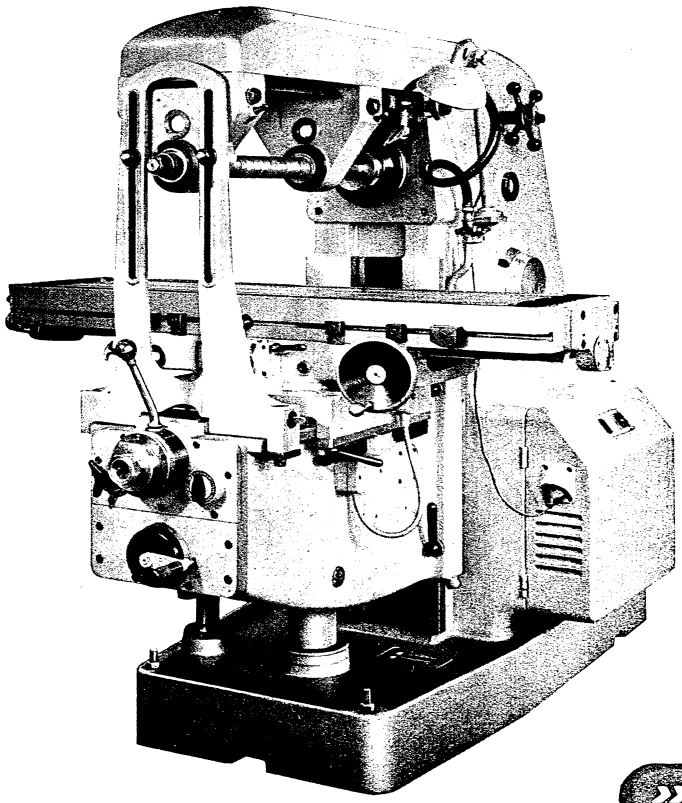
# UNIVERSAL MILLING MACHINE *UF 22*

High-production machine with up-to-date single-lever control, equally suitable for operations with high-speed steel and carbide-tipped tools. The column of handsome design has a pyramidal shape, has strong internal ribs, it is smooth on the outside and, therefore, easily cleaned. The knee travels along the ground ways at the front of the column. Spindle is driven off the main motor through Vee-belts and a 20-speed gearbox. The table can be swivelled in either sense through 45°. Table, saddle and knee feeds and rapid traverses are derived from a separate traverse motor which forms an integral unit with the feed gearbox arranged inside the knee. Feed cycles, consisting of alternating feeds and rapid traverses are adjustable by means of stops. The combined electrical, hydraulic and mechanical drives are controlled by a single lever. This lever starts spindle rotation in either sense, engages the selected spindle speed and table, saddle and knee feeds and rapid traverses. The versatility of these machines is ensured by a broad range of attachments.



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# VERTICAL MILLING MACHINE VF 22

## SPECIFICATIONS

| | Metric | English |
|---|---|---|
| Table, overall size | 1500×385 | 59"×15 3/8" |
| Table, working surface | 1340×280 | 52 1/2"×11 1/8" |
| Table, longitudinal travel | 800 | 32" |
| Table, transverse travel | 280 | 11 1/8" |
| Table, vertical travel | 400 | 16" |
| Max. distance, centreline of spindle to table | 480 | 19 1/8" |
| Spindle, vertical travel (by hand) | 160 | 6 5/6" |
| Spindle, range of speeds, RPM | 19 to 1500 | 19 to 1500 |
| Number of feeds | 18 | 18 |
| Driving motor, HP | 12.5 | 12.5 |
| Rapid traverse motor, HP | 2.5 | 2.5 |
| Weight | 3940 kg | 8668 lbs |

## EQUIPMENT

STANDARD: 12.5 HP motor, 2.5 HP motor, 0.14 HP motor all operative on 380 volts, 50 cycles, 3-phase a-c; coolant pump built integrally with motor, complete with piping; electrical control equipment; set of wrenches; work light.

EXTRA: 450 mm dia circular table with 360° circular scale, hand-driven: swivel vice with 220 mm wide jaws and 360° circular scale.

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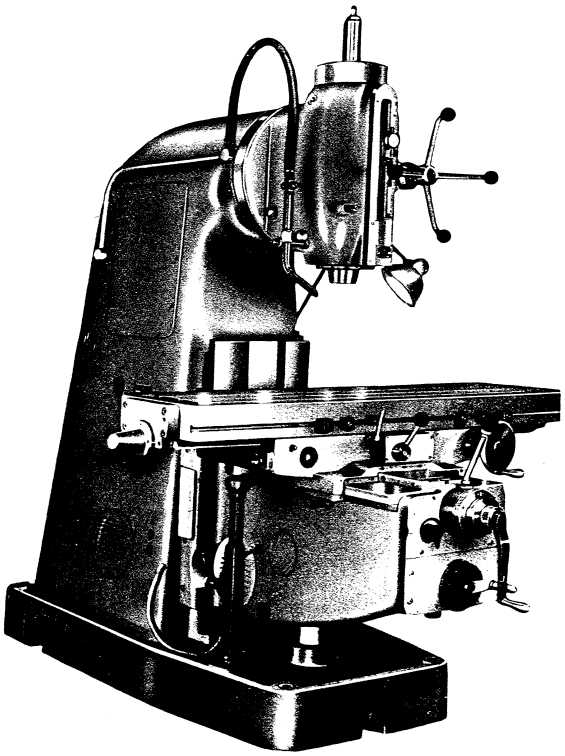
# VERTICAL MILLING MACHINE VF 22

Modern high production machine with single lever control for operations using carbide-tipped or high-speed steel tools. Frame is of an up-to-date pyramidal shape, amply ribbed on the inside, with smooth surfaces. Knee travels along the ground ways at the front of the column. Torque to the spindle is transmitted through Vee-belts, a 20-speed gearbox and spiral bevel gears. Table, saddle and knee feeds as well as rapid traverses are powered by a separate motor through a gearbox, both forming a unit built into the knee. Automatic feed cycles are available through a combination of stops, feeds and rapid traverse. Head is swivelable through 90° to both sides. Mechanical, hydraulic and electrical mechanisms are controlled by a single lever. Spindle is started in either direction, selected speeds engaged and all feed motions controlled by this lever.



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# UNIVERSAL MILLING MACHINE UF. 23

## SPECIFICATION

| | |
|---|---|
| Table, overall surface | 1600 × 400 mm |
| Table, working surface | 1440 × 295 mm |
| Table, longitudinal travel | 1000 mm |
| Table, transverse travel | 280 mm |
| Table, vertical travel | 400 mm |
| Table, swivel in either sense | 45° |
| Spindle, distance of centreline to table surface ..... max. | 495 mm |
| Spindle, distance os centreline to table surface ..... min. | 95 mm |
| Spindle, number of speeds | 16 |
| Spindle, range of speeds | 30 to 950 RPM |
| Number of feeds | 12 |
| Rapid traverse | 2000 mm per min. |
| Main motor rating | 9 HP |
| Traverse motor rating | 2.5 HP |
| Weight | 3800 kg |

STANDARD EQUIPMENT: 9 HP motor, 2,5 HP motor, both operative on 380 volts, 3-phase, 50 cycles a. c.; coolant pump built in one with motor, complete with piping; control equipment, complete; 40 mm dia. arbor; set of wrenches; oil gun; oil can; grease gun; work light.

EQUIPMENT SUPPLIED AT EXTRA COST: Vertical milling head with 90° swivel to either side; slotting attachment with 90° swivel to either side; universal dividing head, complete; 450 mm dia circular table hand riven; 450 mm dia. circular table for power drive; power drive for circular table; vice, 180 mm jaws; vice, 220 mm jaws; one each 22, 27, 32, 50 mm dia. arbor.

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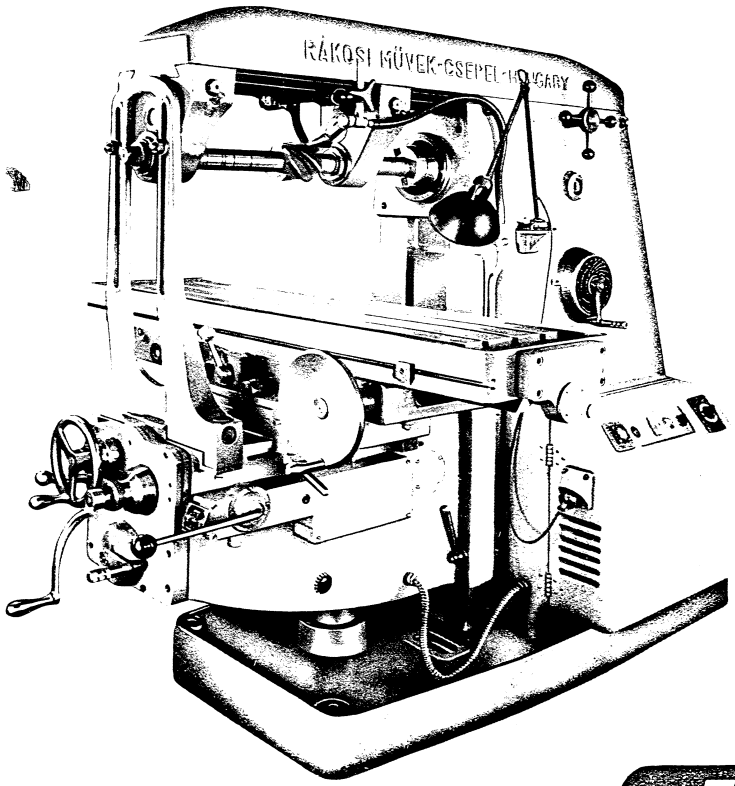
# UNIVERSAL MILLING MACHINE UF23

The design of these machines satisfies all requirements of up-to-date manufacturing technique. Their rugged construction ensures accuracy and freeness of chatter under the heaviest loads. Operation is easy due to the practical arrangement of the controls. Their column is high, provided with strong internal ribs, smooth on the outside and therefore easily cleaned, with an upward tapered form. The knee travels along the broad vertical ways at the front of the column. Feeds and rapid traverses of table, column and knee are powered by a separate motor forming an integral unit with the feed gearbox. Limit stops and switches are provided. The spindle is driven by a motor mounted in the column through Vee-belts and a 16-speed gearbox. The spindle is supported in high-precision, two-row cylindrical roller bearings, thrust is taken by thrust ball bearings. Forced feed lubrication is provided by vane-type oil pumps, one each for the speed and feed gearboxes.

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# VERTICAL MILLING MACHINE VF 23

## SPECIFICATION

| | |
|---|---|
| Table, overall surface | 1600 × 400 mm |
| Table, working surface | 1440 × 295 mm |
| Table, longitudinal travel | 1000 mm |
| Table, transverse travel | 300 mm |
| Table, vertical travel | 400 mm |
| Spindle, max. distance to table surface | 480 mm |
| Spindle, vertical travel (by hand) | 160 mm |
| Spindle, number of speeds | 16 |
| Spindle, range of speeds | 30 to 950 RPM |
| Milling head swivel in either sense | 90° |
| Number of feeds | 12 |
| Rapid traverse | 2000 mm per min. |
| Main motor rating | 9 HP |
| Traverse motor rating | 2.5 HP |
| Weight | 3900 kg |

STANDARD EQUIPMENT: 9 HP motor, 2.5 HP motor, both operative on 380 volts, 3-phase, 50 cycles a. c.; coolant pump built in one with motor, complete with piping; control equipment, complete; set of wrenches; oil gun; grease gun; work light.

EQUIPMENT SUPPLIED AT EXTRA COST: 450 mm circular table for power drive; power drive for circular table; 450 mm circular table, hand-driven; stop roll; vice, 180 mm jaws; 220 mm jaws.

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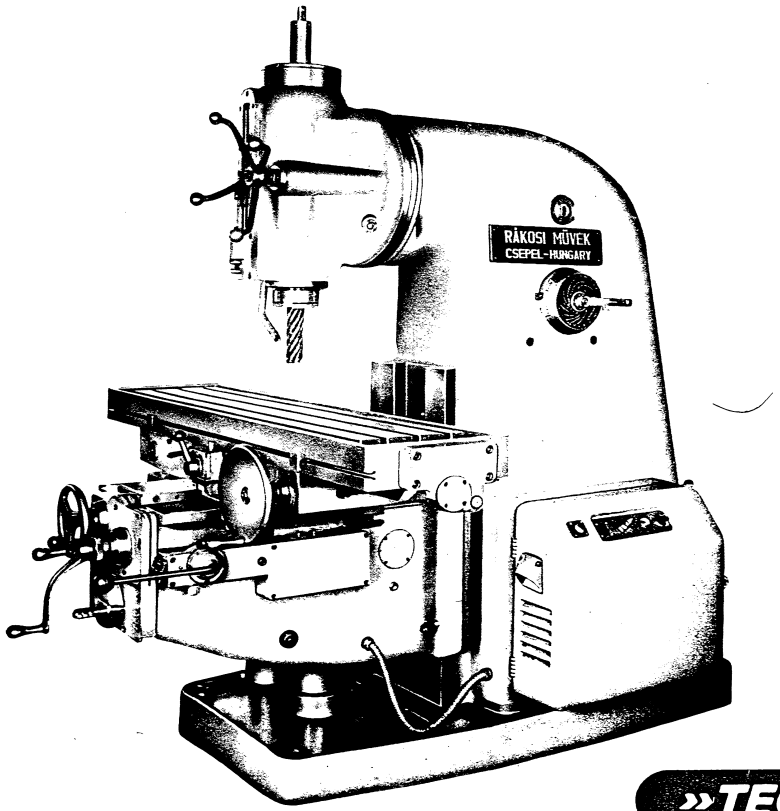
# VERTICAL MILLING MACHINE *VF23*

The design of these machines satisfies all requirements of up-to-date manufacturing technique. Their rugged construction ensures accuracy and freeness of chatter under the heaviest loads. Operation is easy due to the practical arrangement of the controls. Their column is high, provided with strong internal ribs, smooth on the outside and therefore, easily cleaned, with an upwards tapered form. However, in contrast to Type UF-23 machines, their column is not closed on top by a flat surface but extends forwards neck-like and terminates in a flange to which the milling head casting is attached. The knee travels along the broad vertical ways at the front of the column. Feeds and rapid traverses of table, column and knee are powered by a separate motor forming an integral unit with the feed gearbox. Limit stops and switches are provided. The spindle is driven by a motor mounted in the column through Vee-belts and a 16-speed gearbox. The spindle is supported in high-precision, two-row cylindrical roller bearings, thrust is taken by thrust ball bearings. Forced feed lubrication is provided by vane-type oil pumps, one each for the speed and feed gearboxes.

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# PUNCHING AND SHEARING MACHINE LSU 16

## SPECIFICATIONS

| | |
|---|---|
| Punching radius | 300 mm |
| Length of shears | 200 mm |
| Length of stock to be cut with shears (by several cuts) | 240 mm |
| Max. hole diameter to be pierced (with material of 16 mm thickness) | 24 mm |
| L-sections to be cut with form cutter | 90×90×10 mm |
| T-sections to be cut with form cutter | 75×75×10 mm |
| Circular section to be cut with form cutter | max. Ø 28 mm |
| Rectangular section to be cut with form cutter | 25×25 mm |
| Max. thickness of material to be cut with the shears | 16 mm |
| Number of strokes p. min. | 33 |
| Motor rating | 6.4 HP |
| Weight | 1800 kg |

STANDARD EQUIPMENT: 6.4 HP motor operative on 380/660 volts, 50 cycl. 3-phase a. c.; 1 motor protecting switch, set of vee-belting; 1 pair of form cutters; 1 pair of shears; 1 punching tools; set of wrenches; 1 oil can.

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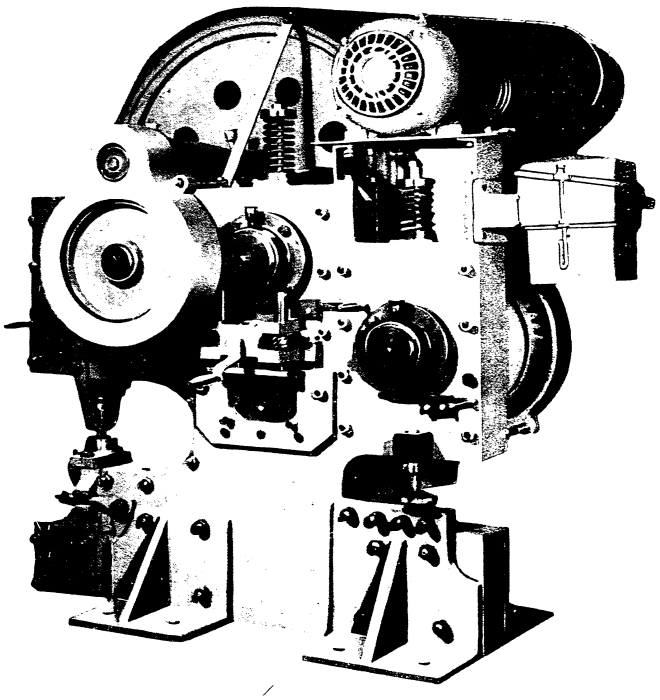
# PUNCHING AND SHEARING MACHINE *LSU16*

This machine designed for cutting flat iron as well as bars of circular, square, T and L sections, and for piercing flat iron and plate iron, is indispensible in bridge and dam building. Its frame is built of steel plates with cast iron feet at the bottom on both sides for greater stability. The machine is driven by an electric motor mounted on top of the frame through gear transmission or directly by a flywheel. The cast iron guide, where she slides of the punch form cutter and shears move is located between the two frame-plates and is fastened by transversal pins. Slides are kept in upper position by spiral springs. For all the three tools the work-piece is kept in position with great force by a heavy duty clamp. All bearings of the machine have bushings of phosphor-bronze.



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# HYDRAULIC COLD SAW DF 1

## SPECIFICATIONS

| | Metric | English |
|---|---|---|
| Sawblade diameter | 420 | 16 3/4" |
| Max. round stock capacity (dia) | 150 | 5 7/8" |
| Min. round stock capacity (dia) | 10 | 3/8" |
| Max. stroke of power stock feed | 250 | 10" |
| Speeds, number | 3 | 3 |
| Speeds, range, RPM | 13.5-22.7-31.4 | 13.5-22.7-31.4 |
| Max. saw head feed (infinitely variable) | 600 per min. | 24" per min. |
| Motor, HP | 5.2 | 5.2 |
| Weight | 1770 kg | 3894 lbs |

## EQUIPMENT

EQUIPMENT: 5.2 HP motor operative on 380 volts, 50 cycles, 3-phase a-c; coolant pump built integrally with motor; electrical control equipment; hydraulic equipment; bar stock support; set of wrenches. Sawblades supplied extra.

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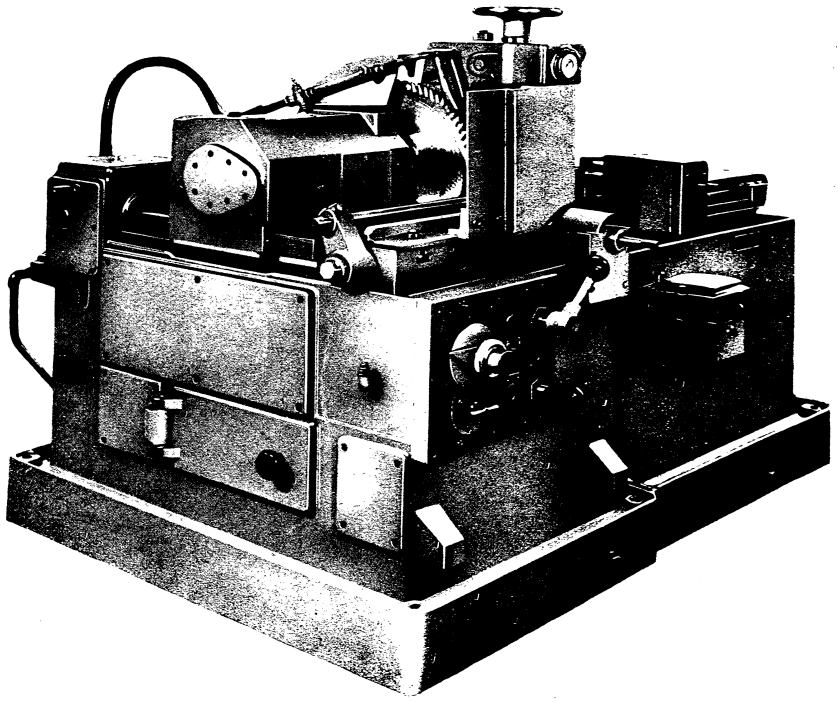
# HYDRAULIC COLD SAW DF1

Heavy-duty machine for serial production, fully automatic in operation. Operator's job only consists in providing the stock. Can also be worked semi-automatically and by hand. Enclosed box-type frame incorporating all drives, control equipment, oil container of hydraulic mechanism and coolant tank. Saw head with change-speed box travels along broad, ground ways on top of the frame. Vertical vice and pressure gauge are mounted on this frame, stock feeding device is arranged on an auxiliary frame bolted to the main frame. Sawblade is provided with three speeds, feed is infinitely variable. Sawblade spindle and drive shafts are supported in bronze bearings, other rotating parts are mounted on ball bearings. Forced feed lubrication is provided.



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# TYPE RL 2500 PLATE SHEAR

**SPECIFICATION:**

| | |
|---|---|
| Length of blade, mm | 2750 |
| Cutting length, mm | 2500 |
| Capacity (max. thickness of plate), mm | 15+15% |
| Max. tensile strength of plate, kg per sq mm | 60 |
| Number of strokes per min | 10 |
| Motor, HP | 20.5 |
| Weight, kg | 15.820 (33.222 lbs) |

EQUIPMENT: 20.5 HP motor, operative on 380-volt, 50-cycle, 3-phase a-c, complete with starter. Set of blades supplied extra.

Right reserved to change dimensions, weight and design.

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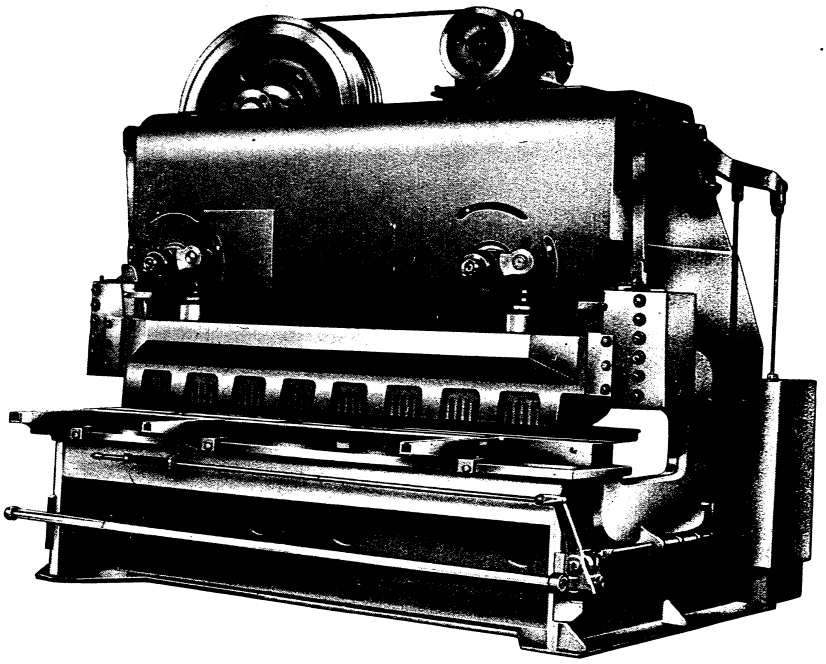
# PLATE SHEARS *RL 2500*

Indispensable in shipyards, boiler shops, for bridge construction etc., this machine can be used for shearing plates of a max. thickness of 17 mm, and a max. length of 2500 mm in continuous operation or by single cuts. Will also cut strips. The channel-shaped frame is made of electrically welded steel plates. The motor, built on top of the frame, transmits torque to the large flywheel through Vee-belts. Flywheel is equipped with shear pins for protection against overloads and imparts drive to the gearing. The output shaft of the gearing raises and lowers the upper blade holder by means of a crankpin and a rocker arm. The upper blade holder has a simultaneous vertical and sidewise motion so that both shearing and cutting are effected at the same time. A set of 4 blades is mounted on the lower blade holder. The plate is secured in position by a hold-down device operated automatically by the rocker arm. Cutting angle is adjustable to suit plate thickness.



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# SHAPER PW 550

## SPECIFICATION

| | Metric | English |
|---|---|---|
| Max. length of stroke | 550 | $21^{21}/_{32}$" |
| Min. length of stroke | 60 | $2^{3}/_{8}$" |
| Table adjustment, horizontal | 540 | $21^{1}/_{4}$" |
| Table adjustment, vertical | 320 | $12^{7}/_{16}$" |
| Max. distance between top of table and bottom of ram | 380 | $14^{13}/_{16}$" |
| Vertical travel of toolbox | 140 | $5^{33}/_{64}$" |
| Cutting speeds, number | 8 | 8 |
| Number of strokes per min, range | 17 to 169 | 17 to 169 |
| Number of feeds | 11 | 11 |
| Motor, HP | 5.2 | 5.2 |
| Weight | 1850 kg | 4000 lbs |

EQUIPMENT: 5.2 HP motor operative on 380 volts, 50 cycles, 3-phase a-c, complete with starter; set of Vee-belts; cranks; set of wrenches; oil gun; work light. Swivel vice with 360 dial scale supplied extra.

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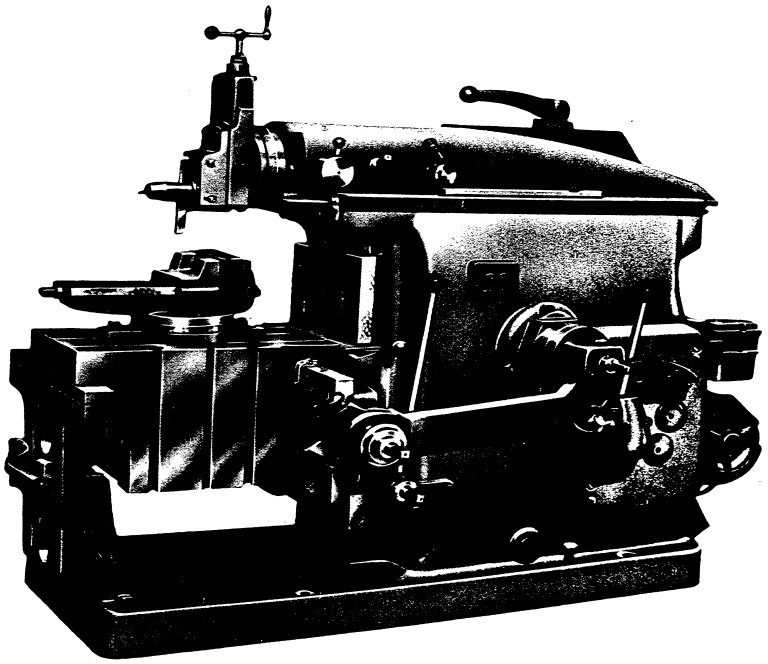
# SHAPER PW550

Modern, carefully designed and constructed machine which meets all up-to-date requirements for machining straight and formed surfaces. The pyramidal frame is cast integraly with the baseplate. Ram ways are square. Ram stroke length and position can easily be adjusted during operation. Toolbox is swivelable, swivel angle is indicated on a dial. A stroke scale ensures direct reading of the set stroke and indicates the number of strokes at a cutting speed of 20 m per min. The box-type table is provided with a sturdy support and can be adjusted both horizontally and vertically.



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# HYDRAULIC COLDSAW MFF 1000

## SPECIFICATION

| | |
|---|---|
| Max. saw diameter | 1000 mm |
| Max. diameter of circular table | 1400 mm |
| Feed p. minute (stepless) | 0—270 mm |
| Stroke | 500 mm |
| Cutting speed (with blade of 1000 mm Ø) | 9—12—17 mp. min. |
| Table displacement in vertical direction | 500 mm |
| Table displacement in horizontal direction (both to right and left) | 300 mm |
| Max. cutting depth | 320 mm |
| Saw motor rating | 10 HP |
| Table motor rating | 6 HP |
| Hydraulic motor rating | 3.5 HP |
| Weight | 17.230 kg |

STANDARD EQUIPMENT: 10 HP electric motor, 6 HP electric motor and 3.5 HP electric motor, all operative on 380/220 volts, 50 cycl. 3-phase, a. c.; coolant pump built in unit with motor, complete with piping; control device; lamp; set of wrenches.
EQUIPMENT SUPPLIED AT EXTRA COST: Saw blade.

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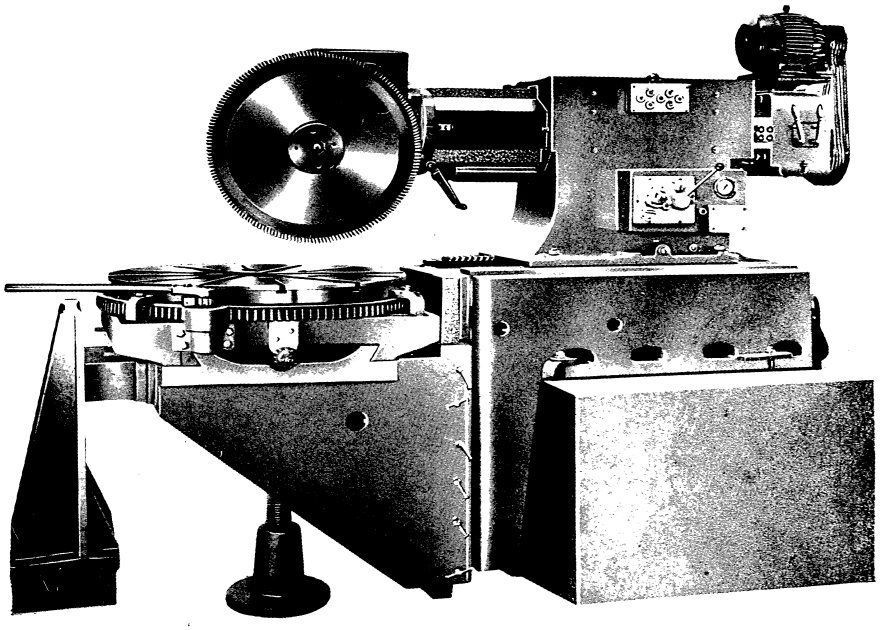
# HYDRAULIC COLDSAW *MFF 1000*

This type of saw is indispensable in steel foundries for cutting off sullage pieces or running heads. The MFF 1000 coldsaw consists of three large castings. Frame supports saw head at one end, saw motor and 3-step gear case being at the other end. Saw head is a gear case driven by the electric motor through a speed-change gear. Saw head and saw blade can be revolved manually around the horizontal axis and secured in any position. Saw feed and return is stepless depending on workpiece dimensions and actuated by hydraulic equipment. Pressure in feed cylinder is 25 atm equalling to max. 4100 kg saw pressure. Table swivels around the vertical axis. It can be shifted sidewards by hand and in vertical direction mechanically. Machine is equipped with coolant pump for efficient lubrication.



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# COLUMN DRILL OF 2

## SPECIFICATION

| | Metric | English |
|---|---|---|
| Working surface of table, (dia) | 600 | $23^{5}/_{8}$" |
| Max. distance of spindle from top of table | 750 | 30" |
| Max. distance of spindle from top of baseplate | 1200 | $47^{1}/_{4}$" |
| Distance of spindle from column | 445 | $17^{1}/_{2}$" |
| Spindle, travel | 300 | $11^{13}/_{16}$" |
| Spindle, diameter | 35/65 | $1^{3}/_{8}-2^{9}/_{16}$" |
| Spindle, taper, Morse No. | 4 | 4 |
| Drilling capacity in solid steel | 40 | $1^{9}/_{16}$" |
| Drilling capacity in solid cast iron | 50 | $1^{15}/_{16}$" |
| Spindle speeds, number | 12 | 12 |
| Spindle speeds, range, RPM | 47.5 to 2100 | 47.5 to 2100 |
| Number of feeds | 8 | 8 |
| Motor, HP | 4.5 | 4.5 |
| Weight | 2200 kg | 4840 lbs |

EQUIPMENT: 4.5 HP motor operative on 380 volts, 50 cycles, 3-phase a-c, complete with starter; coolant pump built integrally with motor, complete with piping; set of wrenches; work light. Vice and quick-change collet supplied extra.

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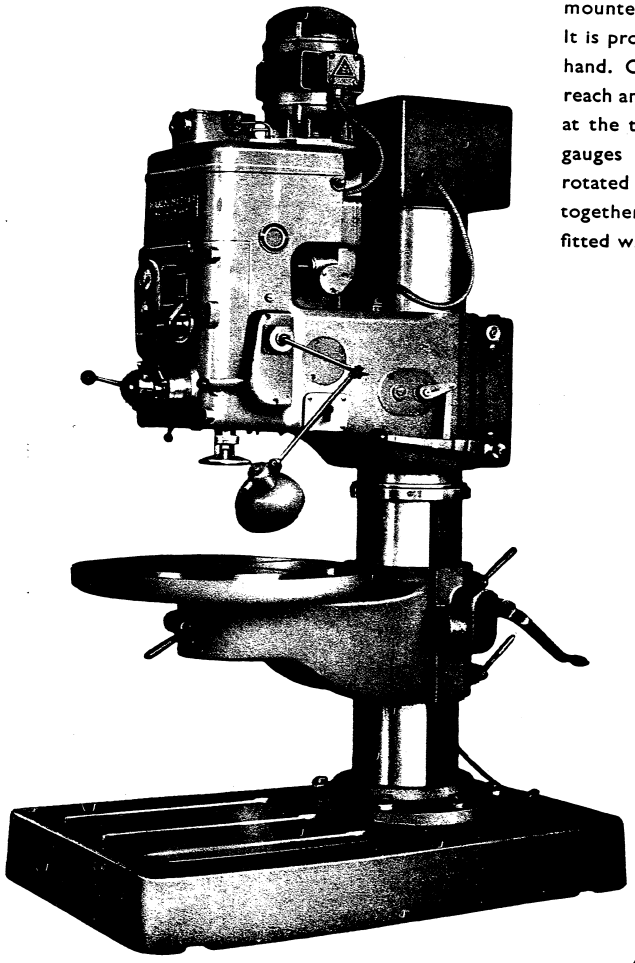
# COLUMN DRILL *OF 2*



Medium-size machine for drilling, boring, countersinking, reaming and tapping operations in high-tensile materials. Drilling head can be traversed vertically along and swiveled about the column bolted to the baseplate. The drilling head is identical with the type mounted on the well-known Type RF Radial Drills. It is provided with power feed and can be clamped by hand. Operation is simple, controls are within easy reach and are operated directionally. Motor is arranged at the top of the head, controls, instruments and oil gauges are at the front. The circular table can be rotated around its axis and swivelled about the column together with its bracket. Table and baseplate are fitted with Tee-slots.

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# RADIAL DRILLS RF 5A AND RF 5B

## SPECIFICATION

| | Metric | | English | |
|---|---|---|---|---|
| | RF 5a | RF 5b | RF 5a | RF 5b |
| Spindle, max. distance from column | 2290 mm | 3040 mm | 88 1/4" | 119 1/2" |
| Spindle, min. distance from column | 540 mm | | 21 1/4" | |
| Spindle, max. distance from base-plate | 2110 mm | | 82 3/4" | |
| Spindle, travel | 400 mm | | 16" | |
| Spindle, diameter | 60/100 mm | | 2 3/8" 4" | |
| Spindle, taper, Morse No. | 6 | | 6 | |
| Extension arm, vertical travel | 1650 mm | | 65" | |
| Drilling capacity in solid steel | 80 mm | | 3 1/4" | |
| Drilling in solid cast iron | 100 mm | | 4" | |
| Spindle speeds, number | 21 | | 21 | |
| Spindle speeds, range, RPM | 15 to 1500 | | 15 to 1500 | |
| Number of feeds | 18 | | 18 | |
| Drilling motor, HP | 12/15 | | 12/15 | |
| Elevating motor, HP | 5.2 | | 5.2 | |
| Weight | 13 600 kg | 15 600 kg | 29 920 lbs | 34 320 lbs |

## EQUIPMENT

STANDARD: 12/15 HP motor, 5.2 HP motor, 0.4 HP clamping motor, all operative on 380-volt, 50-cycle, 3-phase a-c; coolant pump built integrally with motor, complete with piping; electrical control equipment; set of wrenches; work light; cubic table with 550×550 mm (22"×22") surface.

EXTRA: Tilting table; vice; collet chuck; quick change collet.

Rights reserved to change dimensions, weight and design.

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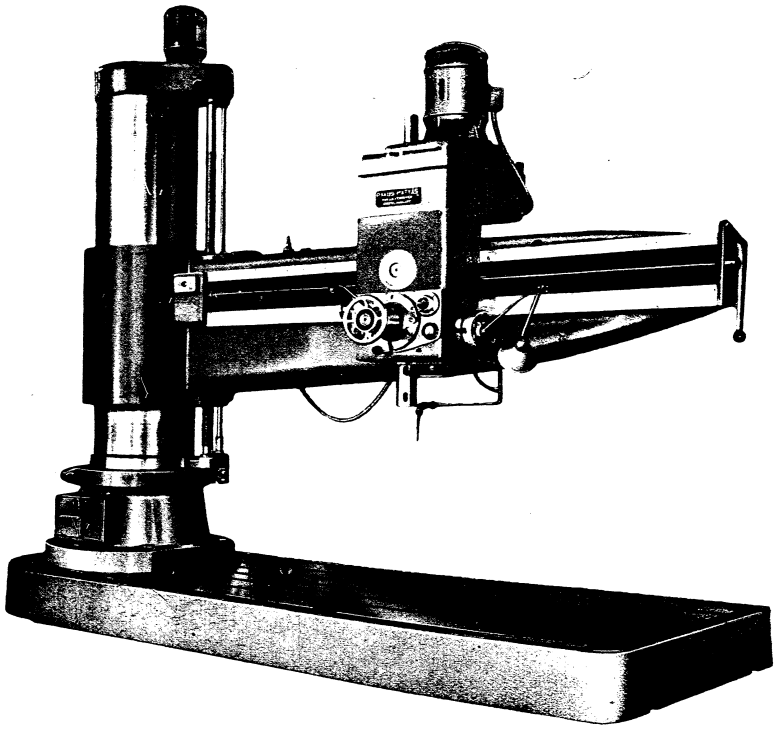
# RADIAL DRILLS RF 5

For drilling, boring, reaming and tapping very large and cumbrous work with a high degree of accuracy in ship-yards, boiler shops, etc. Can also be used with adequate fixtures as a substitute for horizontal boring mills. Extension arm, cast with a shell-shaped cross section and provided with diagonal ribs, embraces shackle-like the polished sleeve suspended on the robust column. Extension arm with sleeve can be swiveled through 360° about the column. The former is elevated and lowered by a separate motor; limit switches at top and bottom trip the motion. Extension arm is automatically clamped to the column when not being traversed. Drilling head can be traversed horizontally by hand, it is clamped to the extension arm by an electrohydraulic mechanism operated by push-buttons. Pre-selection of speeds and feeds. Cutting speed calculator. Easy operation by means of controls concentrated at the front of the head. Operator, machine and tool are safeguarded by numerous safety features.



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# VERTICAL MILLING MACHINE MF 1000

## SPECIFICATION

| | |
|---|---|
| Table, working surface | 200×1000 mm |
| number of Tee-slots | 3 |
| longitudinal travel, by hand | 640 mm |
| power | 630 mm |
| transverse travel | 225 mm |
| vertical travel | 375 mm |
| Spindle, taper | Morse No. 4, ISA No. 44 or metric 32, as speficied |
| vertical travel | 60 mm |
| nose, distance from table ..... max. | 375 mm |
| ..... min. | 0 mm |
| distance centre-line to column ways | 250 mm |
| range of speeds | 63 to 2800 RPM |
| optional | 90 to 4000 RPM |
| Feeds number | 13 |
| Main motor rating | 3.25 HP |
| Traverse motor rating | 0.7 HP |
| Weight | 905 kg |

STANDARD EQUIPMENT: 3.25 HP motor, 0.7 HP motor, both operative on 380 volts, 3-phase, 50 cycles a. c., coolant pump built in one with motor, complete with piping, control equipment complete, oil pump, set of wrenches, work light.
EQUIPMENT SUPPLIED AT EXTRA COST: 250 mm dia. circular table with hand drive and 360° graduation, vice.

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HUNGARIAN MACHINE INDUSTRIES FOREIGN TRADE COMPANY
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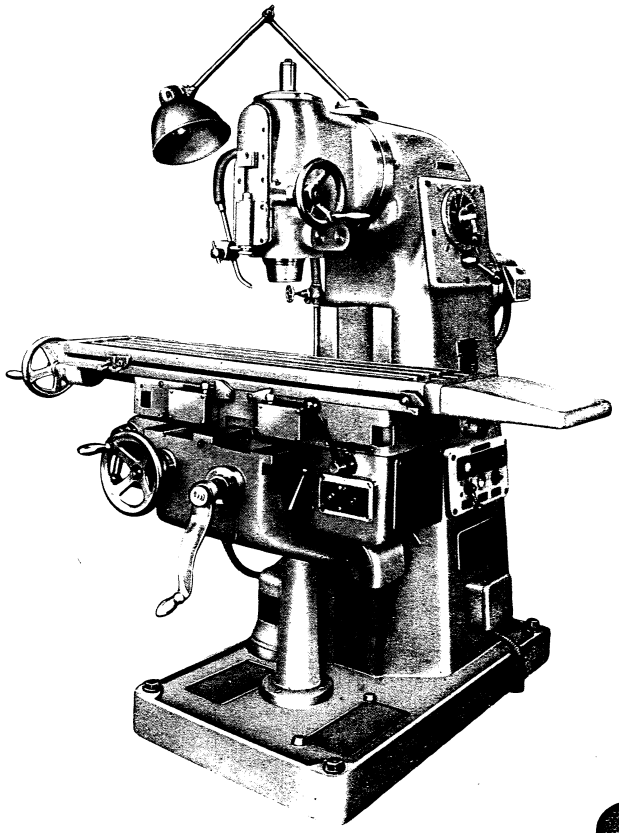
# VERTICAL MILLING MACHINE *MF1000*

An up-to-date, heavy-duty machine offering highest economy in machining both individual jobs and large lots. Its rugged, smooth, tapered column of handsome design is provided with strong inside ribs. The table is dependably supported in its extreme positions by the broad table ways. The feed drive, an integral unit which also powers rapid traverse, is arranged inside the knee together with its motor. Automatic feed cycles, feeds alternating with rapid traverses, are controlled by adjustable stops. The spindle is powered by a separate motor transmitting torque through a 12-speed gearbox. Spindle is vertically adjustable and is provided with automatic depth control. Accurate spindle adjustment is effected by means of a dial indicator. The milling head is provided with a 45° swivel in either sense. Two separate systems of forced-feed lubrication supply lubricant to the speed gearbox in the column and the feed gearbox in the knee as well as to the ways.



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# PERCEUSES D'ÉTABLI ET À COLONNE, FP 6, 10 ET 13

## DONNÉES TECHNIQUES

| Modèle | FP 6 | FP 10 | FP 13 |
|---|---|---|---|
| Portée | 170 | 170 | 170 mm |
| Capacité maximum de perçage en acier | 6 | 10 | 13 mm ⌀ |
| Capacité maximum de perçage en fonte | 9 | 15 | 18 mm ⌀ |
| Distance maximum entre le nez de la broche et la table | 235 | 235 | 235 mm |
| Dimensions de la table | 220 × 220 | 220 × 220 | 220 × 220 mm |
| Vitesse de la broche | 1200— 2100—3960 tours/min. | 730— 1380—2600 tours/min. | 650— 1050—1980 tours/min. |
| Puissance du moteur électrique | 0,44 | 0,44 | 0,44 Kw |
| Poids de la machine | 105 | 105 | 105 kg |

ACCESSOIRES: 1 moteur électrique 220/380 V, 50 pér. 3 phases, 1 interrupteur, 1 mandrin.

Le droit de changer dimensions, poids et construction est réservé.

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ENTREPRISE HONGROISE POUR LE COMMERCE EXTÉRIEUR DE MACHINES
BUDAPEST V, DOROTTYA U. 6 • B. P. 183 BUDAPEST 62 • TÉLÉGRAMMES: TECHNOIMPEX

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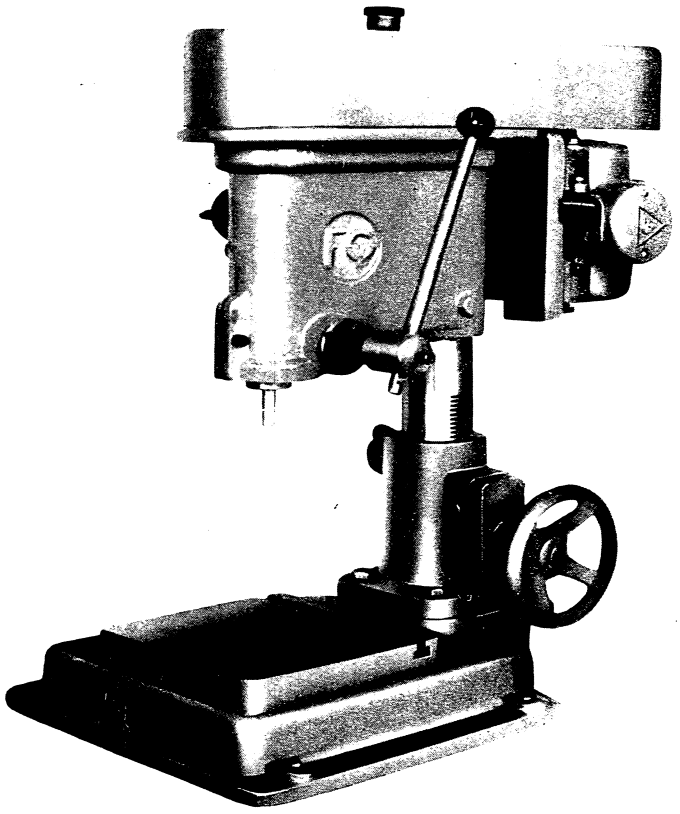
# PERCEUSES D'ÉTABLI ET À COLONNE *FP6-10-13*



Ces petites perceues sont également indispensables dans les petits ateliers, dans les ateliers de réparation et dans les grandes usines. La colonne est fixée à la table rigide par 4 boulons. La tête de la machine est montée sur la colonne et porte le moteur de commande à la paroi arrière, construite en forme d'une base pour moteur. Une poulie à 3 gradins pour courroie trapezoïdale est montée sur l'axe du moteur et entraîne la broche par une courroie trapézoïdale sans fin en caoutchouc. La broche tourne en roulements à billes. L'avance de la broche se fait à la main. Un ressort incorporé retire la broche en position supérieure. 3 vitesses de broche peuvent être choisies à l'aide de la poulie à 3 gradins. Un secteur denté et une crémaillère permettent le réglage de la tension de la courroie trapézoïdale de commande. La distance entre la pièce à usiner et la broche se règle à l'aide d'un pinion avec crémaillère et d'un engrenage à vis sans fin.

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# 800-TON FRICTION SCREW PRESS

## SPECIFICATION

| | |
|---|---|
| Rated pressure | 800 tons |
| Max. pressure | 1500 tons |
| No. of strokes per min. | 15 |
| Spindle dia. | 300 mm |
| Table dimensions | 750×1000 mm |
| Ram dimensions | 600× 700 mm |
| Ram stroke | 650 mm |
| Max. distance, table to ram | 1370 mm |
| Min. distance, table to ram | 720 mm |
| Distance between guide ways | 800 mm |
| Motor rating, approx. | 45 to 55 kw |
| Motor speed | 1440 RPM |
| Pump motor rating | 2.6 HP |
| Weight | 45 000 kg |

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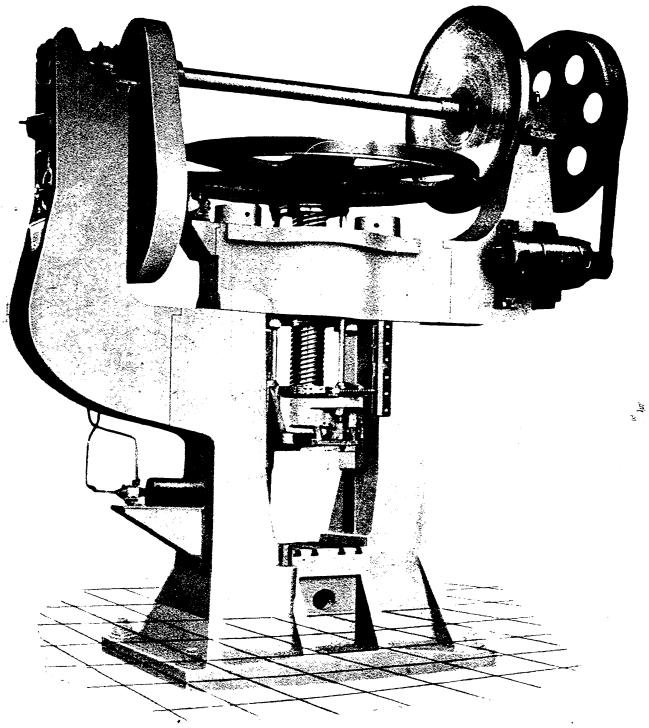
# 800-TON FRICTION SCREW PRESS

As screw presses in general, this press can be used for the forging of various medium size forged pieces as well as for bending and straightening. The frame, cross brace, large gear, friction discs and ram are steel castings. The spindle is provided with a 5-start buttress thread and is made of the highest grade alloy steel. The spindle nut is of wrought bronze. The friction disc is controlled by a hydraulic (3 to 5 atm.) servomotor mechanism. The friction lining is made of ungreased leather and slips under overloads. The friction disc is connected to the threaded spindle through two shear pins which are sheared off by overloads. The lateral friction discs are adjustable. The elevated ram is stopped by an automatic brake thereby preventing its collision with the cross brace. The driving motor is mounted on the bearing bracket.



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# INCLINABLE ECCENTRIC PRESS, TYPE PN 2

## SPECIFICATION

| | |
|---|---|
| Max. pressing force at 30° before lower dead centre | 20 000 kg |
| Work depth | 160 mm |
| Max. distance between ram and table | 300 mm |
| Gap in frame | 250 mm |
| Table dimensions | 310×500 mm |
| Table opening diameter | 180 mm |
| Adjustable stroke | 10—70 mm |
| Number of strokes p. min. | 100 |
| Adjustment range of ram | 50 mm |
| Motor rating | 3 HP |
| Weight | 950 kg |

STANDARD EQUIPMENT: 3 HP motor operative on 220/380 volts, 50 cycl. 3-phase, a. c.; 1 stating device; set of vee-belting; 1 wrench; 1 oil-can.

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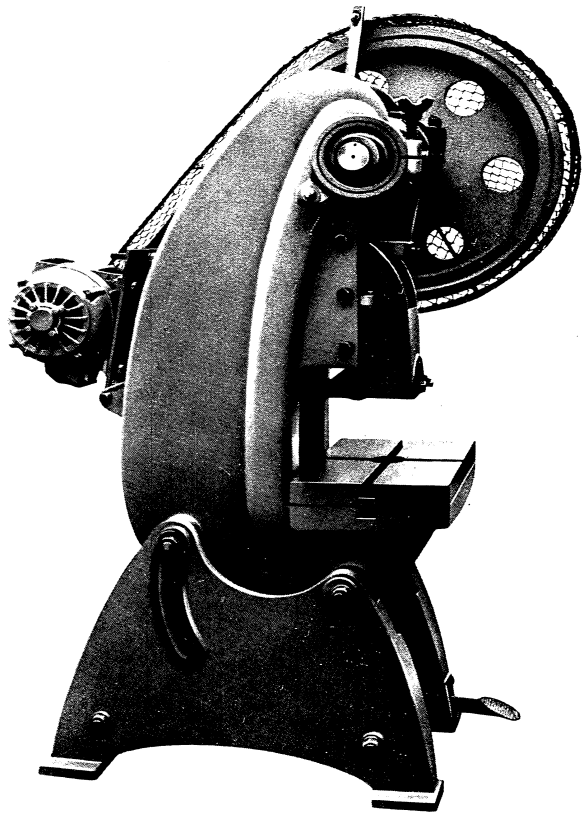
# INCLINABLE ECCENTRIC PRESS PN 2



Tiltable eccentric presses affording comfortable control to the operator are among the most frequently used machines in mass production industries. The cast iron frame is pivoted by journals in cast iron feet so that it can be tilted up to 40 degrees. The main shaft runs in two bearings with bronze bushings. The pitman head also has bronze bushing on the crank pin. Stroke length is adjusted by latter. Pitman and ram are connected by knuckle joint. Tool holder of ram has adjustable ejector. The foot-operated tripping mechanism is of the pin clutch type connecting the crank shaft with the flywheel. Crankshaft is driven directly by the electric motor through vee-belting. Free end of crank shaft is suited for driving an automatic feeding device. Braking is performed by cast iron ring with adjustable, spring-loaded brake lining of permanent effect. Journals are equipped with grease boxes, other sliding surfaces being oil-lubricated.

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# INCLINABLE ECCENTRIC PRESS, TYPE PN 4

## SPECIFICATION

| | |
|---|---|
| Max. pressing force at 30° before lower dead centre | 35 000 kg |
| Work depth | 190 mm |
| Max. distance between ram and table | 330 mm |
| Gap in frame | 270 mm |
| Table dimensions | 380×570 mm |
| Table opening diameter | 120 mm |
| Adjustable stroke | 10—80 mm |
| Number of strokes p. min. | 60 |
| Adjustment range of ram | 60 mm |
| Motor rating | 3.8 HP |
| Weight | 1300 kg |

STANDARD EQUIPMENT: 3.8 HP motor operative on 220/380 volts, 50 cycl. 3-phase a. c.; 1 starting device; set of vee-belting; 1 wrench; 1 oil-can.

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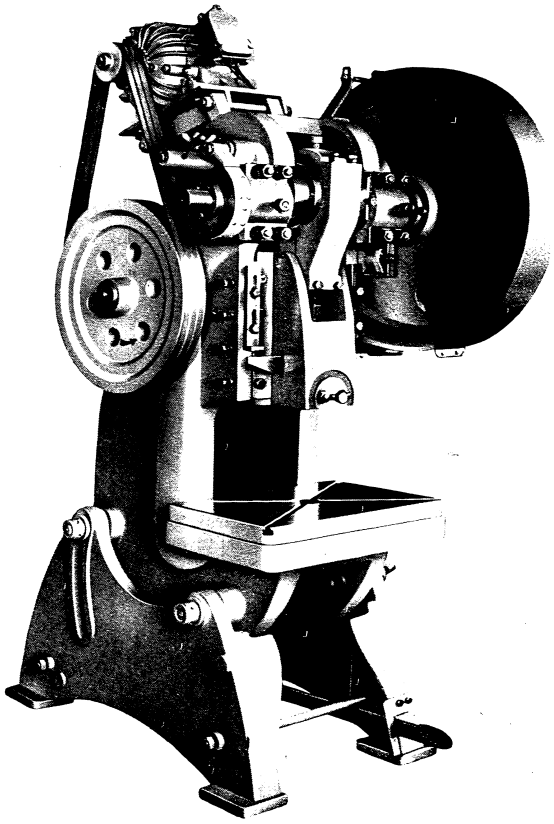
# INCLINABLE ECCENTRIC PRESS *PN4*



Tiltable eccentric presses affording comfortable control to the operator are the most characteristic machines in mass producing industries. The cast iron frame is pivoted by journals in cast iron feet so that it can be tilted up to 40 degrees. The main shaft runs in two bearings with bronze bushings. The pitman head also has bronze bushing on the crank, pitstroke length is adjusted by latter. Pitman and ram are connected by knuckle joint. Tool holder of ram has adjustable ejector. The foot-operated tripping mechanism is of the pin clutch type connecting the crank shaft with a large cogwheel. Flywheel is on common shaft with small steel pinion engaging with large, cast iron cogwheel on crank shaft. Gears are protected by iron plate cover. Free end of crank shaft is suitable for driving an automatic feeding device. After finishing the work cycle, before the upper dead centre, the brake automatically engages with the crank shaft releasing it in similar manner at re-starting. Journals are equipped with grease heads, other sliding surfaces being oil-lubricated.

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# ECCENTRIC PRESS PX1

## SPECIFICATION

| | |
|---|---|
| Max. pressing force at 30° before lower dead centre | 6000 kg |
| Work depth | 108 mm |
| Max. distance between ram and table | 180 mm |
| Table dimensions | 200×300 mm |
| Table opening dia. | 80 mm |
| Adjustable stroke | 10/40 mm |
| Number of strokes p. min. | 160 |
| Adjustment range of ram | 40 mm |
| Motor rating | 1 HP |
| Weight | 300 kg |

STANDARD EQUIPMENT: 1 HP motor operative on 380 volts, 50 cycl., 3-phase a. c.; 1 starting device; set of vee-belts; 1 oil can.

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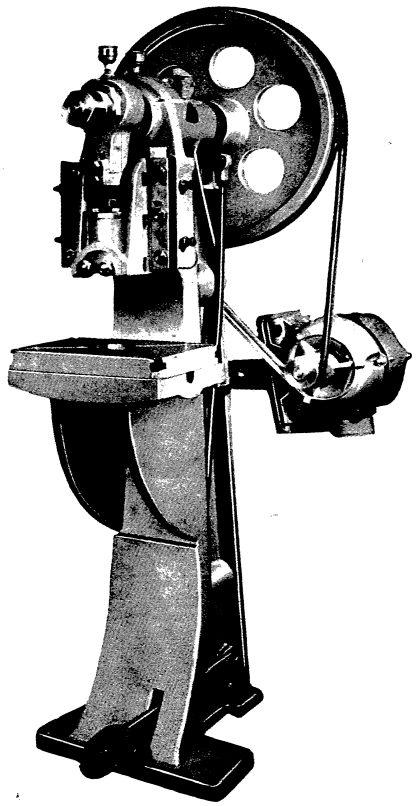
# ECCENTRIC PRESS PX 1



This machine belongs to the group of single-action eccentric presses with stationary table. Eccentric main shaft runs in ball bearings of the cast iron frame. Pitman runs in bronze bushing and is linked to crank pin of main shaft by eccentric claw coupling designed for adjusting stroke length. Pitman and ram are connected by a knuckle joint. Distance between table and ram is adjustable. The tripping mechanism is of the pin clutch type connecting the main shaft with the flywheel. A simple brake block of bronze frictioning to the main shaft ensures that the moving masses stop at the upper dead centre of eccentric at the moment of tripping. The bolster plate with the F slots for holding workpieces is screwed to the table-like part of the frame. Journals are equipped with grease boxes, other sliding surfaces being oil lubricated.

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# VERTICAL TURNING AND BORING MILL SE 2F 1300

## SPECIFICATION

| | Metric | English |
|---|---|---|
| Table dia | 1300 | 51 1/8" |
| Max. turning diameter | 1450 | 57 1/4" |
| Cross travel of ram heads | 700 | 27 3/4" |
| Max. distance, table to rams | 1000 | 40" |
| Ram travel | 1000 | 40" |
| Table speeds, number | 12 | 12 |
| Table speeds, range, RPM | 3.2 to 50 | 3.2 to 50 |
| Number of feeds | 8 | 8 |
| Driving motor, HP | 15 | 15 |
| Rapide traverse motor, HP | 8.5 | 8.5 |
| Weight | 12.840 kg | 28.248 lbs |

EQUIPMENT: 15 HP and 8.5 HP motor, complete with starters, operative on 380 volts, 50 cycles, 3-phase a-c; coolant pump built integrally with motor, complete with piping; set of wrenches; 4 jaws for table.

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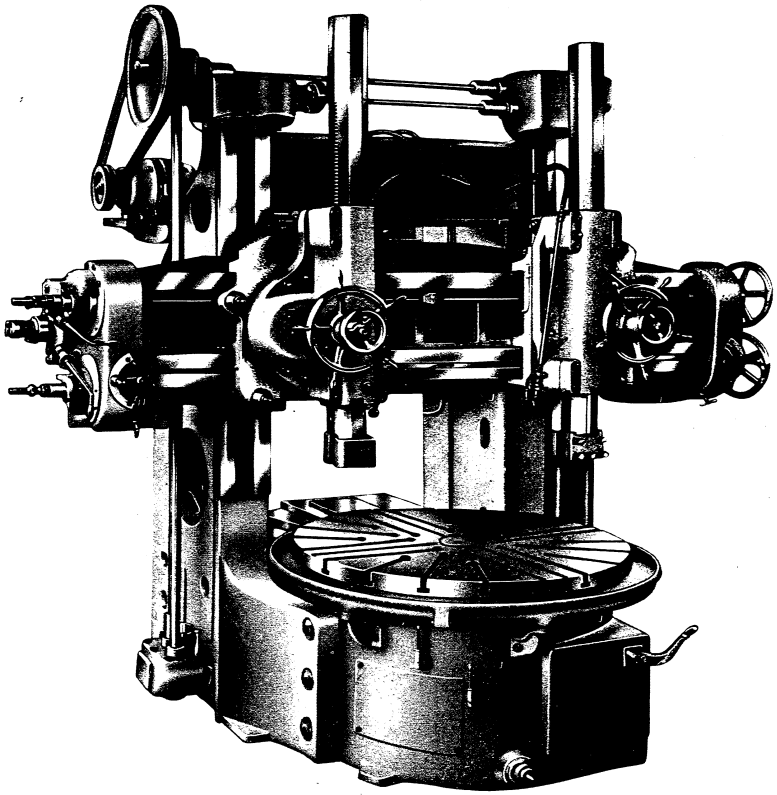
# VERTICAL TURNING AND BORING MILL SE 2F

Indispensable in railway rolling stock manufacture and railway repair shops for machining large work. Simple in operation. Table is supported on a circular V-way forming part of the base casting. Spindle is mounted in two large bronze bearings and on a ball thrust bearing at the bottom. Cross rail with the two ram heads is vertically traversed along the ways of the two uprights. Ram heads are traversed independently of each other along the cross rail. Rams can be traversed vertically and angled through 30° to either side. Ram, ram heads and cross rail are provided with rapid traverse. Tapers can be machined in either direction by means of the taper turning attachment with high accuracy. The 15 HP motor transmits torque to the 12-speed gearbox through a multiple disc clutch. Table drive, speed and feed gears have forced feed lubrication. Rams, ram heads and cross rail are provided with separate lubricating systems.



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# HIGH-CAPACITY HYDRAULIC HACK-SAW, TYPE KF 250

## SPECIFICATION

| | |
|---|---|
| Diameter of round stock to be cut | 250 mm |
| Length of saw blade | 480—500 mm |
| Stroke | 170 mm |
| Number of strokes | 60 and 94 p. min. |
| SAW BLADE: | |
| for stock under 30 mm Ø | 7 teeth in 1 in. |
| for stock under 70 mm Ø | 4 teeth in 1 in. |
| for stock under 250 mm Ø | 2—3 teeth in 1 in. |
| Motor rating | 3 HP |
| Weight | 850 kg |

STANDARD EQUIPMENT: 3 HP electric motor operative on 220/380 volts, 50 cycl. 3-phase a. c. 1 control device; coolant pump built in unit with motor, piping; 1 handle for vice; set of belts; grease-gun; oil-can; set of wrenches.
EQUIPMENT SUPPLIED AT EXTRA COST: Workpiece stand, saw blade.

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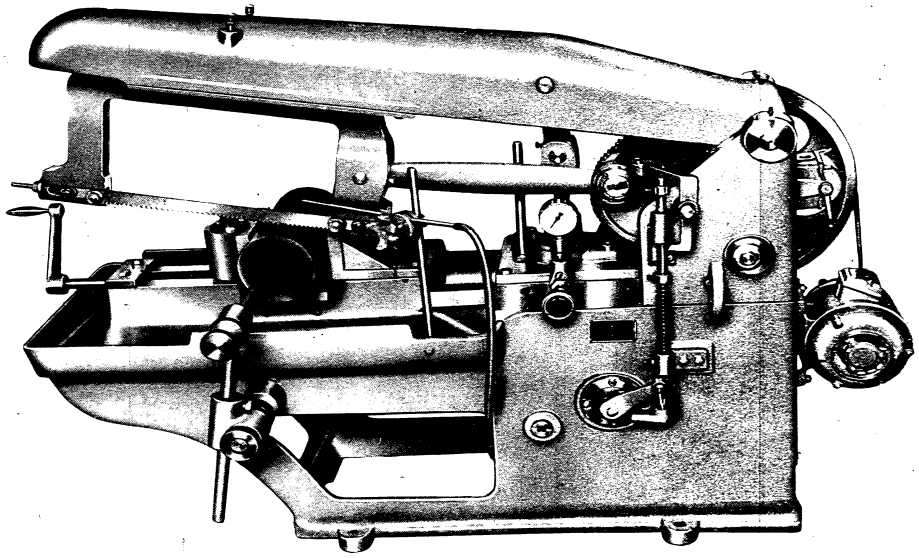
# HIGH-CAPACITY HYDRAULIC HACK-SAW KF 250

A high-capacity hack-saw for cutting single workpieces or smaller bundles working with small chipping gap. Gear-case and oil-pump for hydraulic control are mounted to frame by screws. Cutting pressure is adjusted hydraulically, the pressure being indicated by a gauge of 15 atm. max. rating. Saw frame has vee-guides and the saw is unloaded during return stroke to obviate overstraining. When cutting is finished, head automatically raises and stays in upper position. Machine is equipped with automatic cut out and reversing switch. Two cutting speeds are provided for. Work is hold by vice with flat-threaded spindle clamping quickly and with great force. Fine adjustment limit stop permits of cutting pieces up to 400 mm length. Coolant is kept in circulation by gear pump.



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# MARTEAU À ÉTAMPER À CONTRE-FRAPPE AVEC UNE ÉNERGIE DE FRAPPE DE 13.000 MKG

## DONNÉES TECHNIQUES

| | |
|---|---|
| Pression de service (air comprimé ou vapeur) | 7 kg/cm² |
| Écart maximum entre les moutons, sans étampes | 1100 mm |
| Dimensions de la table | 850×1500 mm |
| Hauteur maximum d'une étampe | 350 mm |
| Poids du mouton supérieur | 13,000 kg |
| Poids du mouton inférieur | 14,000 kg |
| Énergie de frappe | 13,000 mkg |
| Poids de la machine | 65,000 kg |

ACCESSOIRES : Ruban en acier, * roue guide * dispositif pour attacher le ruban d'acier * segment de piston-tiroir * étoupage en caoutchouc pour le piston * disc en caoutchouc pour le support du mouton. Les accessoires marqués * sont des pièces spéciales que nous ne livrons que sur commande et à charge séparées.

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ENTREPRISE HONGROISE POUR LE COMMERCE EXTÉRIEUR DE MACHINES

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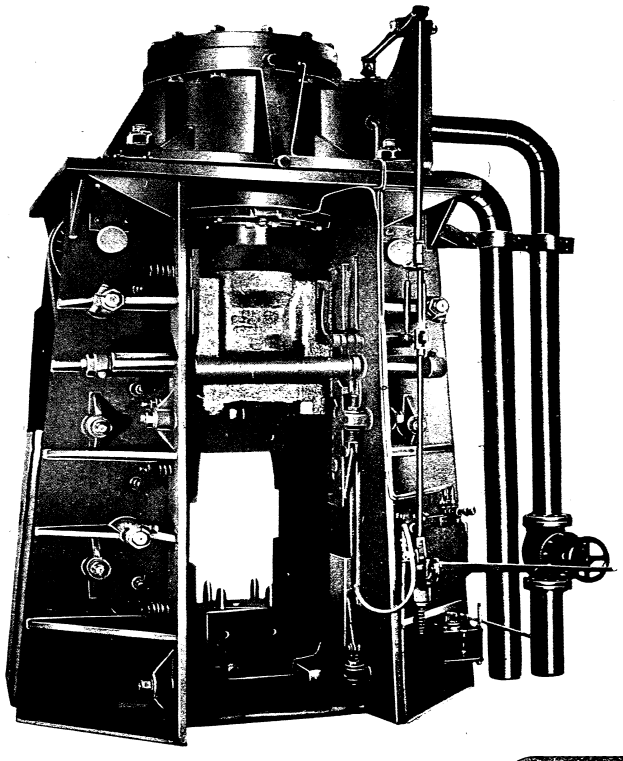
# MARTEAU À ÉTAMPER À CONTRE-FRAPPE AVEC UNE ÉNERGIE DE FRAPPE DE 13.000 MKG

En forgeant l'acier, sa qualité s'améliore, sa texture devient plus compacte et plus fine. Les marteaux à contre-frappe à commande par air comprimé ou par vapeur sont de grande importance dans la fabrication en masse et en grandes séries. Le bâti du marteau est en tôles d'acier. Le mouton supérieur en forme d'une tige de piston est attaché au mouton inférieur par l'intermédiaire de rubans flexibles d'acier montés au côté du premier, et passant par des rouleaux. Quand le mouton supérieur descend, le mouton inférieur montera, grâce à l'action des rubans d'acier et des rouleaux. De cette manière les deux moutons vont se trouver au moment de la frappe. Après le coup, le mouton inférieur au poids plus élevé retire le mouton supérieur à la position supérieure extrême. Des amortisseurs à disques de caoutchouc protègent les rubans flexibles d'acier contre fractures, qui pourraient résulter des secousses puissantes. Les glissières, et les guidages sont pourvus de lubrification centrale, tandis que des godets graisseurs sont montés à tous les autres points à lubrifier.



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# FORGING PRESS WITH COUNTERBLOW ANVIL OF 6000 METRE-KILOGRAMME STRIKING CAPACITY

## SPECIFICATION

| | |
|---|---|
| Operating pressure (air or steam) | 7 atm. |
| Maximum gap (without tools) | 900 mm |
| Table, working surface | 640×1000 mm |
| Maximum height for one tool | 300 mm |
| Weight of upper ram | 6000 kg |
| Weight of lower ram | 7000 kg |
| Striking work | 6000 mkg |
| Weight | 30.000 kg |

EQUIPMENT SUPPLIED AT EXTRA COST: Steel strap; guide wheel; device for attaching steel strap; piston valve ring; rubber packing for piston; rubber discs for buffer.

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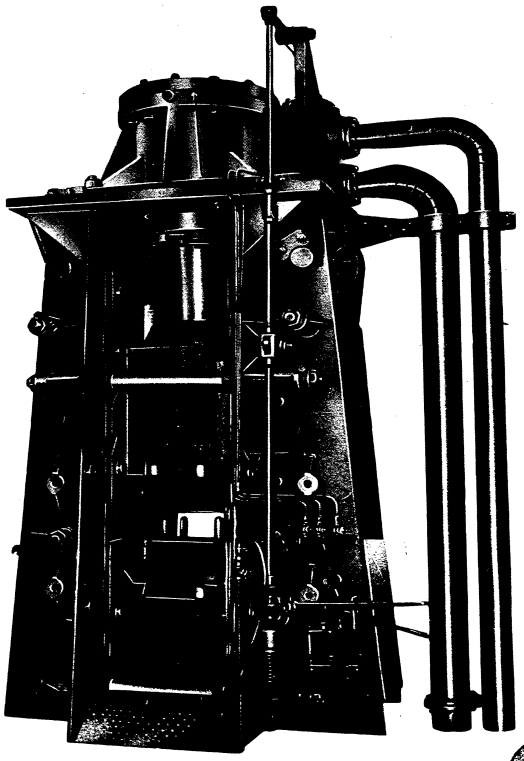
# FORGING PRESS WITH COUNTERBLOW ANVIL OF 6000 METRE-KILOGRAMME STRIKING CAPACITY

Forging improves the quality of steel. It becomes more solid and its texture finer. This is why counterblow forging presses working with either air or steam power are of great importance in mass and series production. The press is built of a steel plate construction the upper ram being the piston rod as well. The lower ram is connected to the side of the upper one by means of elastic steel straps and rollers. When the upper ram proceeds downwards, the lower ram is made to move upwards — against the blow — on the effect of this connection. When the blow has been performed, the lower ram sinks, lifting the upper one back into original position due to its greater weight. Breakage of the elastic steel straps is prevented by rubber discs acting as buffers. Sliding surfaces, guides have force-feed lubrication and there are grease boxes where necessary.



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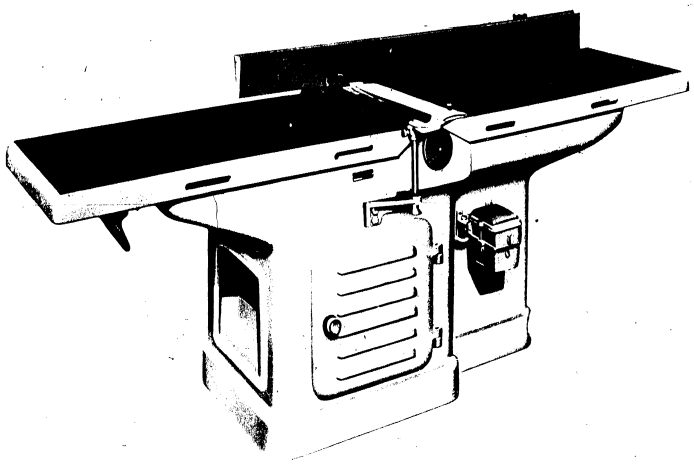
# PLANER FOR THE WOODWORKING INDUSTRY

**Type 510**



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Planing width 510 mm. Length of table 2550 mm. Depth of cut max. 8 mm.

Speed of knife head 4800 r.p.m. Max. speed of cut 32 m/min. Output of driving motor 4 HP. Weight of machine 1150 kg.

The one-piece cast iron frame prevents the machine from vibrating during operation. An exhauster serves to remove chips from the machine.

The hand wheel operated rigid table moves along oblique guides.

The spindle of the tool-head is dynamically balanced and assures smooth running and safe operation even at the highest speeds. The wedges securing the knives are pressed into their seats by the centrifugal force. Tools are adjusted by screws and springs.

The tool-head spindle is carefully mounted in its bearings.

The protecting device delivered with the machine protects operators against accidents.

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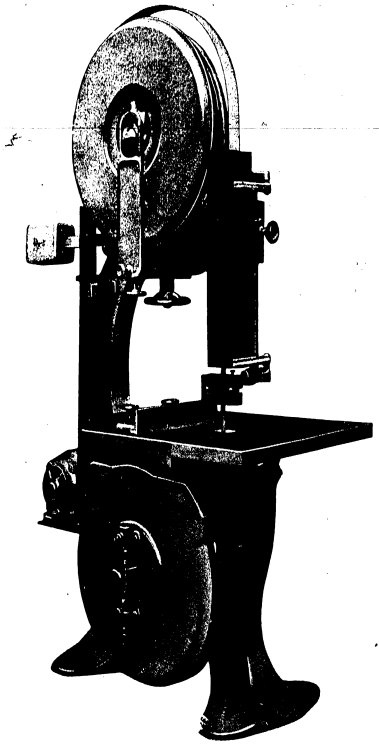

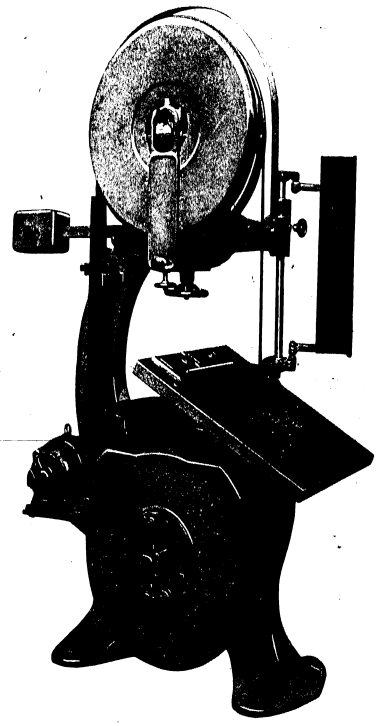

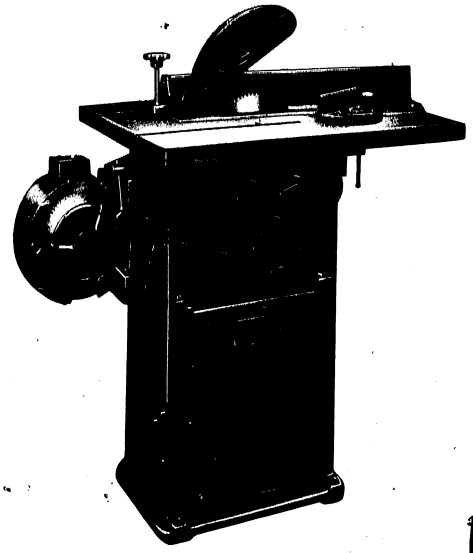

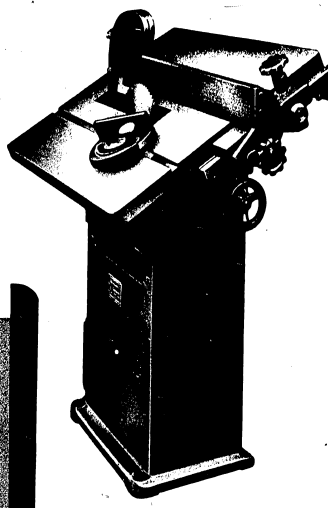

## WOOD-CUTTING BAND SAW

of 816 mm sheave ∅. The sheaves are lined with cork. The very rigid and pleasant frame is of cast iron. The table may be tilted for mitre cuts. The sheave saw shafts run in sturdy ball bearings and are equipped with covers and saw band guide. Drive is effected by a 3 KW electric motor and V-belts. A magnetic starter with motor protection and oil filling is provided.
Weight: 840 kg.

ACCESSORIES: 1 pc saw blade brazed to size • 1 pc guide ledge • V-belts • wrenches • foundation bolts

with 300 mm blade ∅ and vertical blade adjustment. Maximum cutting height 100 mm. Table working surface 650 × 850 mm, tilting by 45°. A slot is machined to the right and to the left of the blade to receive the mitre ledge. The longitudinal ledge is adjustable (at an angle also) according to longitudinal and angular graduation. The machine is driven by a 3 HP electric motor
Weight: 330 kg.

ACCESSORIES: 1 pc saw blade 300 mm ∅ • 1 pc longitudinal ledge with angular setting • 1 pc mitre ledge • 1 pc splitting wedge • 1 pc adjustable guard • wrenches

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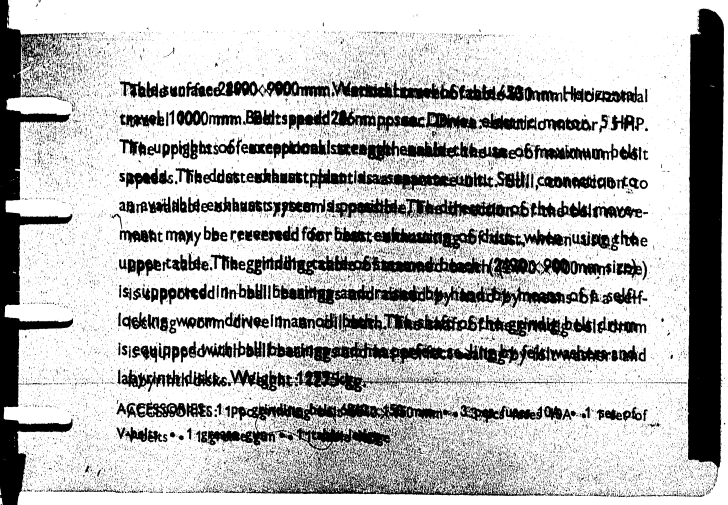
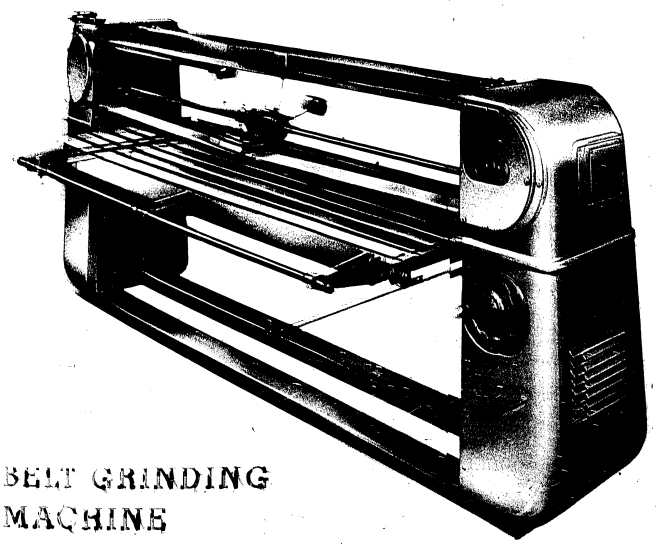
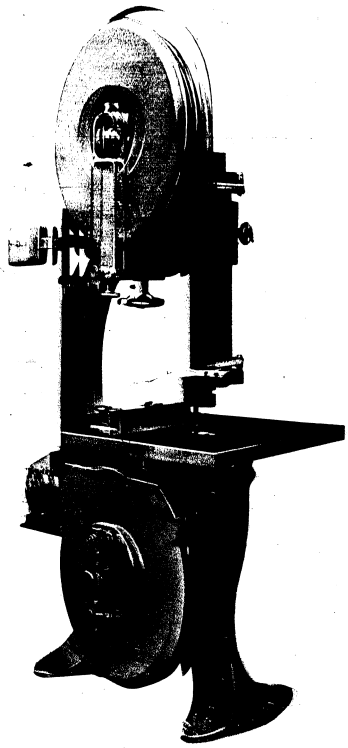
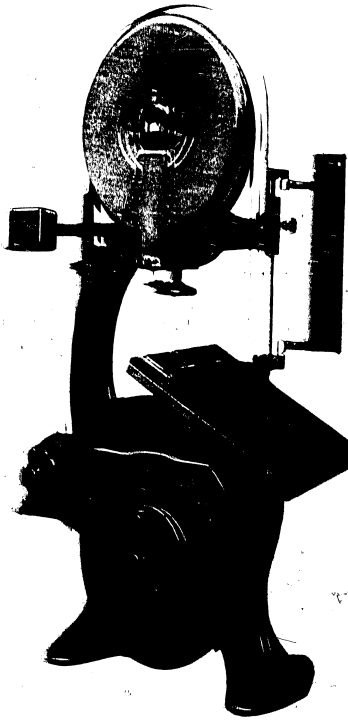




BELT GRINDING MACHINE



WOOD-CUTTING BAND SAW



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